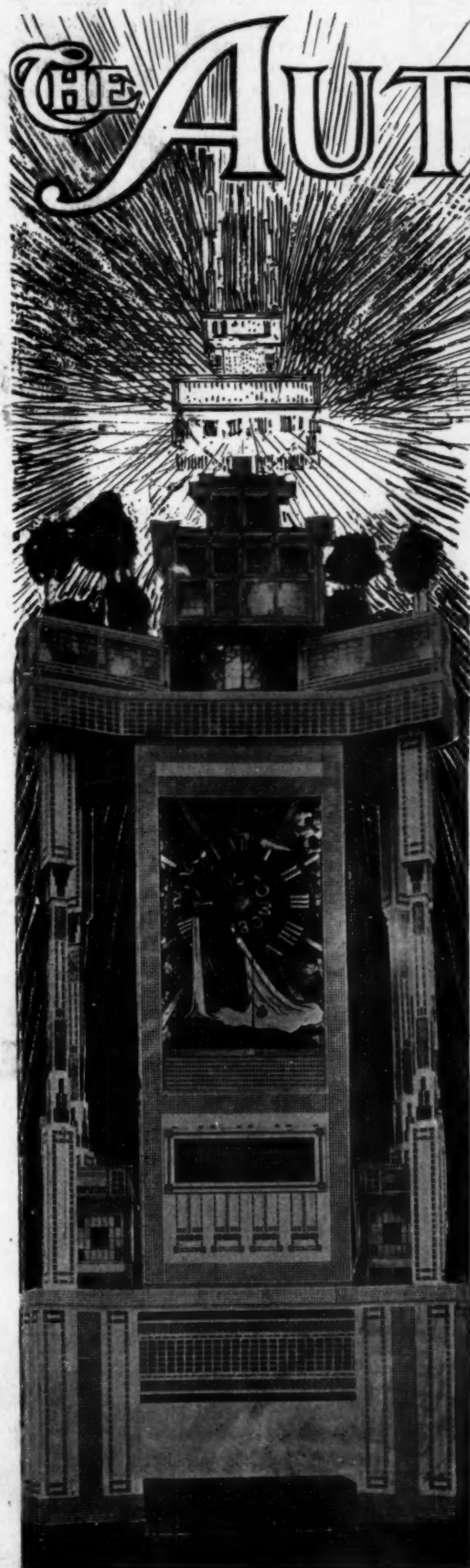


THE AUTOMOBILE

CHICAGO SHOW

"Apex of Exhibitions."



The Mosaic decorative scheme is prevalent throughout the Coliseum

CHICAGO, Jan. 27—The automobile was crowned king once more in the Windy City this afternoon, the exact ceremony taking place at 2 o'clock on the minute when Manager Miles threw open the Coliseum and Armory doors on the occasion of the eleventh national automobile show in this city. While 2 o'clock marked the opening of the ceremony the festivities continued until 10:30 this evening and will be kept going on the touring cars for a week and then will follow a week of motor wagon rule.

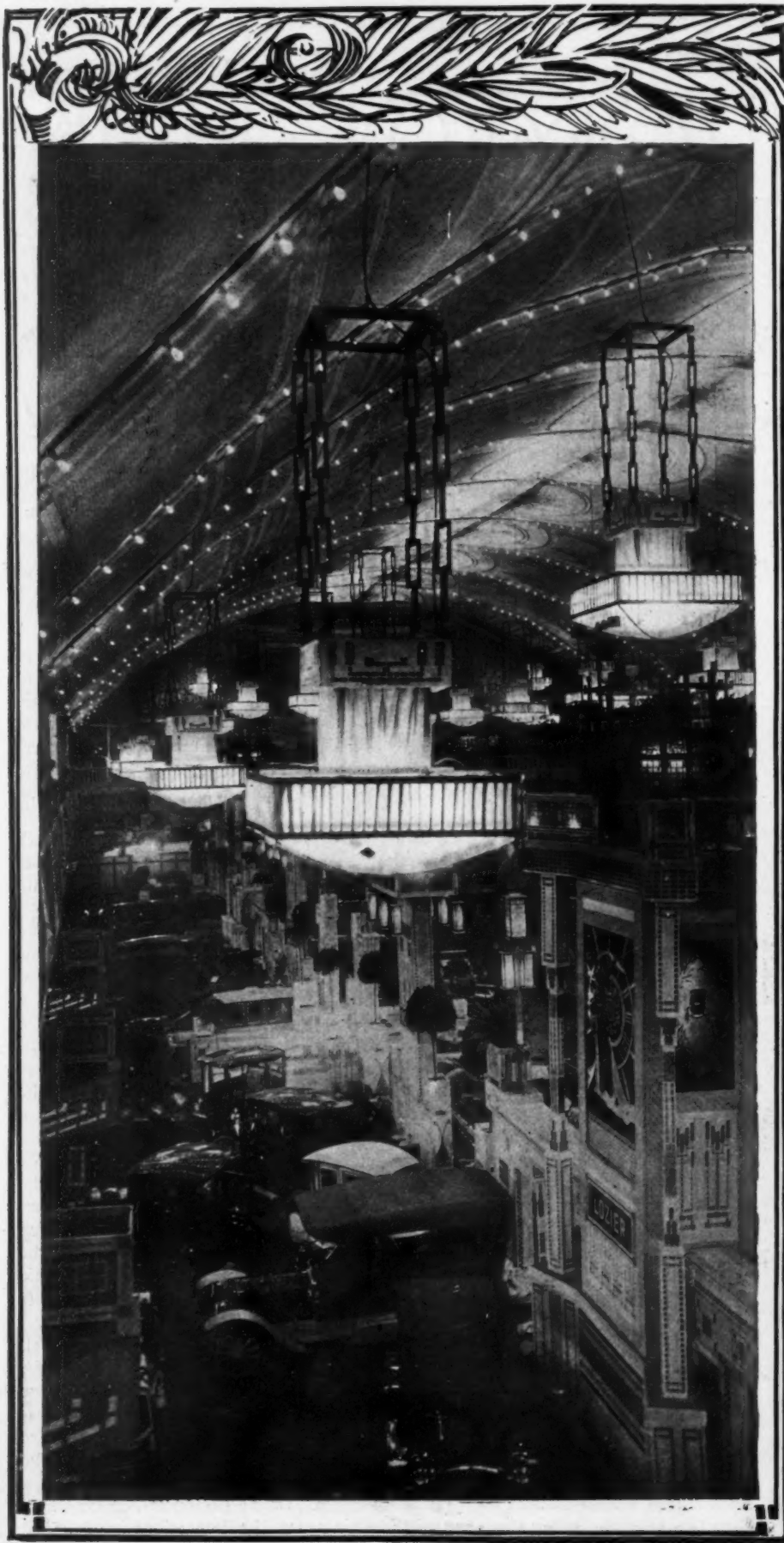
Just as the hands of the clock moved to the opening hour, the band struck up with its opening selection, the last arch of electric lights broke out across the vaulted roof, the doors opened, the crowds swarmed over the entire main floor, and for one more year Chicago was given its opportunity.

The sight that met the eyes of the show visitors on entering the Coliseum was an inspiring one. Never before, with the single exception of the now famous English Garden scheme, has Sam Miles staged so impressive a show. The scheme is mosaic. Mosaic is generally confined to corridor floors in large buildings, but here it is all in the air. The Coliseum auditorium is a huge rectangle, with a narrow balcony on all four sides and an arched roof. Extending from one end to the other and dividing the space off into three sections are two continuations of mosaic tower schemes of decoration. The main pieces of each tower rise from buttresses. They resemble the miniature decorative buildings at a world's fair. The square center shaft is all mosaic in symmetrical designs. Half way up are four huge glass panels in color and emblematic of the car and the spirit of automobiling. Above these the center shaft becomes a mass of green and yellow lights contained in cubes, the cubes forming the capital, and capping all are small evergreens which nearly reach the huge cubical colored lanterns that are suspended from the vaulted roof. To right and left of each main group are smaller mosaic shafts, straight from top to bottom, and carrying evergreens and lights on top.

The entire effect is one of green, yellow and pink lights which blend well with the soft canvas colors entirely concealing the iron arches of the roof. In the words of everybody, it is the lightest and airiest show that has ever been staged. There is not a symptom of depression in it. The decorations do not conceal the cars in the slightest; in fact it is questionable if there ever was another show in which the cars are given the major end of the scheme to such an extent.

This scheme is used only in the Coliseum. In the Coliseum Annex, which is a separate room at one end of the main arena, the decorations are confined to covering the walls, and in the Armory, which stages one-half of the show, a simple scheme as used a year ago has been revived.

Chicago show has always had the reputation of being a business show and this year is not going to prove any exception to the rule. In previous



General birdseye view along the west side aisle of the Coliseum at Chicago, showing decorative scheme

years the agents have come from California, from Colorado, from Texas, Oklahoma, Minnesota, Iowa, Arkansas, Kentucky, Tennessee, Ohio, Indiana, Michigan, Illinois and, in fact, nearly every state west of the Alleghanies. And they are coming this year. Some of them are here already, and many of the heads at the exhibits spoke to-night after the closing of the show of how more dealers had been on hand than ever before at opening night. The show management makes every effort to get these dealers to attend. The automobile builders themselves help the good work along. The majority of the makers will have one kind or another of informal meeting of agents, and in fact nearly every day next week will be occupied by one company or another getting its dealers together. Hudson people are going to give their representatives a breakfast. Stearns will give inventor Knight an opportunity of addressing his Central and Western representatives next Wednesday evening; Halladay interests are planning a regular getting together the same evening; White people are keeping open house every day at noon at hotel headquarters; the Overland people are following up their idea set a year ago of giving all agents and friends a chance of coming together every evening after the show closes in the hotel; and so with a host of other companies, they are all developing the team-work idea, using the show as a place for the maker to get acquainted with the dealer and the dealer to meet his customers.

500 Invitations Issued

While over 5000 invitations have been sent out by the show management to the country-wide dealers it is expected that over 3,000 will register during the week and get their season passes. Each dealer generally brings with him a number of prospects whom he has selected to make sub-agents in his territory. There always has been much of the sub-agent work done at this show, but this year there promises to be more than the average. This is due to changes in policies with several companies. Not a few factories have reduced the number of direct agents, giving their representatives larger territories. This has increased the sub-agent field. With the sub-agent comes the prospect.

Speaking of prospects recalls the days when each exhibitor used to hang a bulletin board in his exhibit space and enter on it the retail sales made. This custom is now obsolete, but nevertheless the retail sales go on. Some companies have already made three or four and there will be more this year than formerly. Many a prospect has held off until seeing the different models at the show before coming across with his de-

posit. In some cases the dealer has purposely held off in order to be among the first to make a sale at the show. Already some of the salesmen report all of the cars on exhibition sold.

There is another reason for more retail sales—the salesmen are more on the job. It used to be that a salesman at the show looked upon his position as a more or less perfunctory one. He considered his rôle more or less that of an entertainer. This is all changed. Before the doors were opened many of the exhibitors had schooled their salesmen. They had held two or three conferences. Where a salesman had poor arguments he was coached on the more convincing ones. He was asked every question that a buyer might ask and if his answers were not up to par he was given better ones. In some cases a dozen or more typewritten pages of arguments were written out and given to the salesmen. This preliminary work is having its effect and even tonight it has been a case of some who came to look remaining to buy. This is an excellent sign of the times. It means that salesmanship is developing and the makers are discovering that it is often as easy to close the sale on the floor of the Coliseum as to close it 30 days later in the local salesroom.

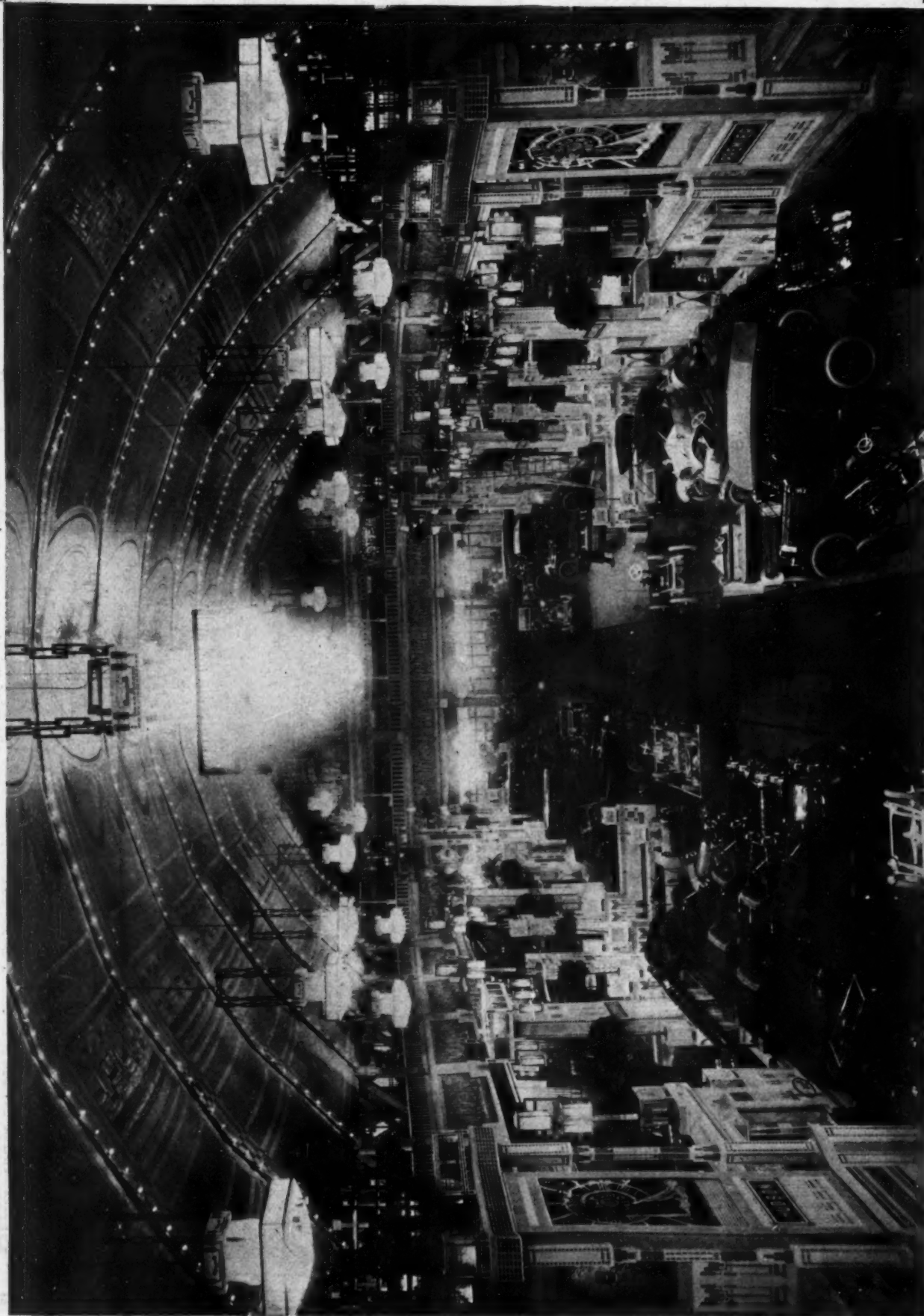
Electrics Hold a Prominent Place

But this show is not all gasoline cars; the electrics are a big factor. A few years ago New York tried to steal away Chicago's thunder in the electric car field but it is all returning. A year ago New York as much as announced that it did not care very much whether electric cars were exhibited or not. ~~of~~ the space was needed for gasoline machines. That helped the Chicago situation and now the Coliseum and Armory shows are the only ones which have a real representation of electric cars. Nearly every electric is shown in the buildings or in the salesrooms along Michigan avenue. The old ones are all in line and there is a host of new ones including Flanders, Standard, Borland, Argo, Grinnell, Century, Colonial and others. The electrics are really features of the show. So greatly have they developed during the year that now they are receiving vastly more attention than formerly. Over half of them are exhibiting chassis and in these call attention to the improved drop frames, the I-beam front axles, the longer springs, the shaft drive, worm drive, floating rear axles, larger brakes, grease cups on the springs and a score of other points indicating progress, which are set forth in detail elsewhere in this issue.

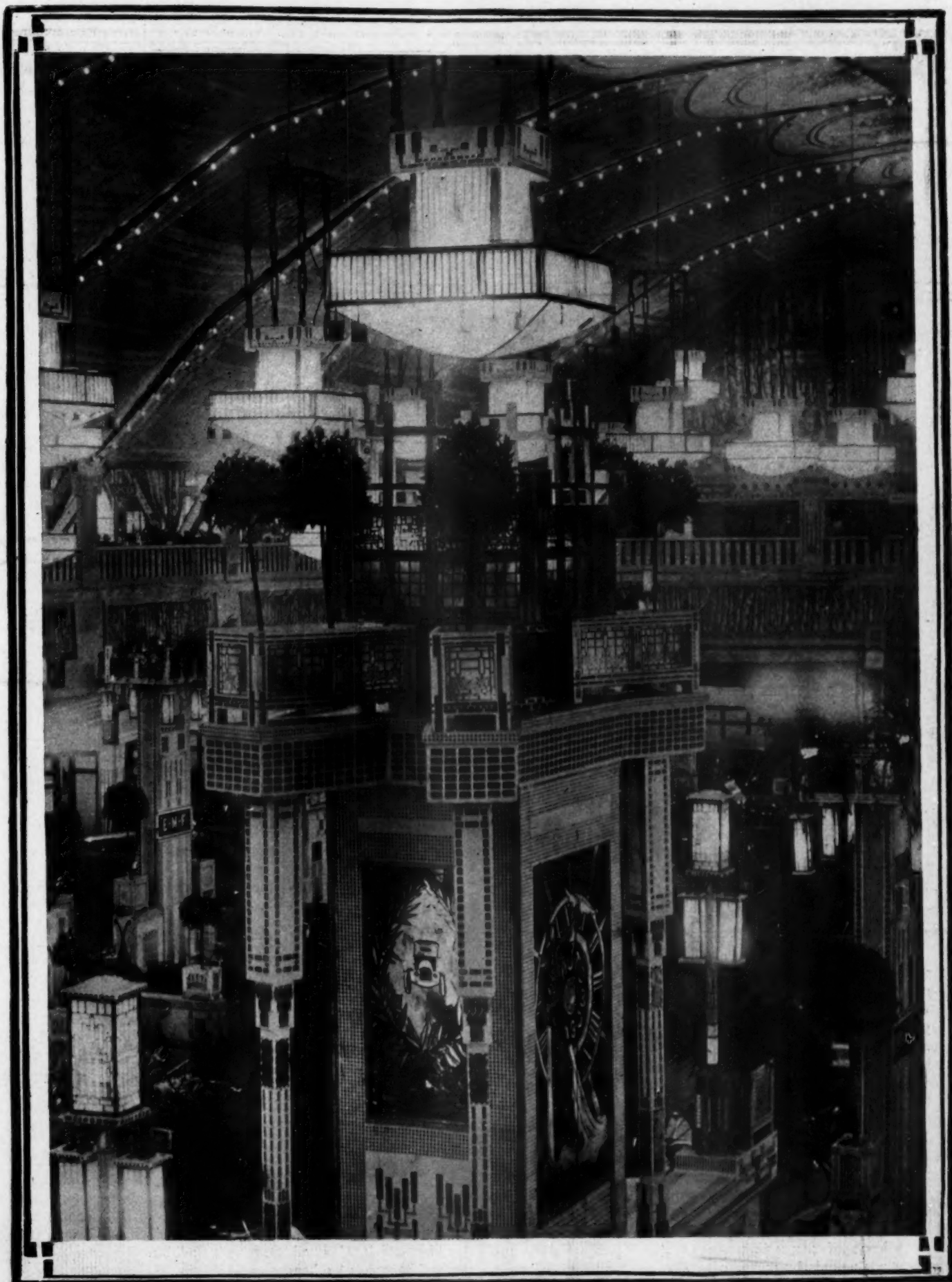
The main floor of the Coliseum is devoted exclusively to car makers, while the balcony is given over to the accessory people. The main floor of the



General birdseye view along the east side aisle of the Coliseum at Chicago, depicting division of space



GENERAL VIEW OF THE COLISEUM LOOKING FROM THE NORTH END OF THE HUGE BUILDING.



THE FAIRYLAND EFFECT, SHOWING THE MOSAIC IN JAPANESE STYLE



Main cross aisle in Coliseum, looking toward entrance

Annex is also occupied by car makers as well as the basement. The overflow is taken care of in the First Regiment Armory, which is located on Michigan avenue and Sixteenth street. The alley which runs between the two buildings has been covered over and admission at either building entitles the visitor to pass through this improvised hallway into the other building.

Around the balcony of the second floor of the Annex and on the balcony of the Armory 184 manufacturers of accessories are holding forth. Every article which goes into the make-up of the complete machine is open to the inspection of the public.

Perhaps the most imposing array of accessories is on view on the second floor of the Annex. Here parts makers hold sway and they reign supreme. Along the sides of this floor and arranged in two rows down its length there is an endless variety of novel exhibits. The Waukesha Motor Company has hit upon the unique scheme of suspending one of its motors weighing no less than 700 pounds by means of a single short length of steel wire one-tenth of an inch in diameter from a bracket at one side of its space. This is done with the idea of not only at-

tracting the attention of the passer-by, who is interested to know how the heavy engine is held up, but also to demonstrate the extreme strength of the grade of steel of which the particular piece of wire is made. It is pointed out that all the crankshafts, camshafts and like parts of these engines are of the same material.

Spark-plug makers have a number of novel ways of attracting attention to their products, such as the use of giant counterparts of their standard articles, causing them to spark across their terminals, having them automatically immersed in baths of oil and then sparking them to show their oil-proof qualities.

The morning attendance of the second day has been a source of wonder to the exhibitors, many of whom were not expecting the crowds before late in the afternoons or at night. In this respect the show far outshines the New York exhibitions. As a whole it is an interested gathering and the dealers and prospective buyers far outnumber those who are merely there to gaze at the year's offerings. This is rather an unusual state of affairs, and perhaps accounts for the fact that the sales in most cases are even now bidding fair to outstrip those enjoyed by any of them at any of the other shows to which they have brought their cars this year. The accessory men have much the same tale to tell.

Auxiliary Exhibitions Numerous

The show is by no means confined to the Armory and Coliseum. There are a number of outside minor exhibitions. The Havers Six and the Paige-Detroit are exhibited in the lobby of the hotel La Salle, the Speedwell at the Sherman house, the S. G. V. and Hamilton at the Auditorium, while independent shows are being carried on by Ford, Midland, Marathon, Pilot, Pratt-Elkhart, Pathfinder, Marion, King, Halladay, Palmer and Singer, Apperson, and the Abbott-Detroit. A number of reasons are given for these outside displays. The Ford company, according to its custom, has attractively decorated and arranged its ample showroom on Michigan avenue and is conducting its own private show. The Silent Valve Engine Company is also showing its engine outside the fold, space having been obtained on the mezzanine floor of the La Salle hotel.

A new policy is being exploited by several of the makers and it is one which was not in evidence at the New York shows. Demonstrating cars are kept outside the Coliseum in waiting and when a prospect or dealer has been sufficiently enthused by the salesman in the exhibit, he is invited to go in one of the cars to the regular salesroom of the company on the Chicago motor row. Here he is shown the more expensive offering and a more satisfactory manner of getting at him seems to be the result. Notable examples of this are the Packard, Everett, Crow and a number of others. The Rambler people go even a step farther in that they conduct the interested one to their factory where, if the difficulty of the case makes it necessary, he is brought into contact with the heads of the concern.

In the way of novel exhibits the E-M-F people have cut one of their Flanders 20 chassis longitudinally throughout its entire length affording the public an exact cross sectional view of the entire assembled machine. The Chalmers company has an attractive exhibit at each side of which a sample motor has been mounted on blocks and equipped with its make of self-starter, which is operated from time to time. The same idea is in evidence at the Cadillac exhibit. Here the Cadillac electric system also shows its ability to run the motor, under the guiding hand of able representatives.

Very elaborate and unique chassis have been brought to Chicago by the majority of the makers. Some of these are of the moving variety being driven by belt-connected electric motors, or the exhibitors rely upon the merits of the assembly to attract attention. Among those who have chassis in operation are the Rambler, Buick, Maxwell, Overland, Cadillac, Chalmers, Matheson and a score of others.

Elaborately finished chassis are being displayed by Packard, Stevens, Locomobile, Hudson, Haynes, Pierce-Arrow, Pope-

Hartford, Thomas, Peerless, Knox, and Hupp. But these are not of the moving variety. Novelties in body design and finish are everywhere in evidence. The Knox exhibit features a 70-horsepower raceabout model which is finished in an imitation of natural ash, this being painted on an aluminum body. Other body finishes of this kind, which include Circassian walnut and mahogany, have been brought out by this company.

The Columbia-Knight model motor attracts much attention and its salient features are brought out by a well-informed demonstrator. This may also be said of the Stoddard-Knight, and the Stearns.

A harmonious exhibit is that of the Lexington company, which appears in the basement of the annex. All the machines shown, which are three in number, are finished in the same quiet style of light brown.

Passing again to the accessories we find the silent-chain proposition as exemplified by such makes as the Whitney, Diamond, Link-Belt, and Coventry appearing for the first time in the Chicago show. While these chain people made their debut at Paris 2 years ago they are just beginning to invade the American market.

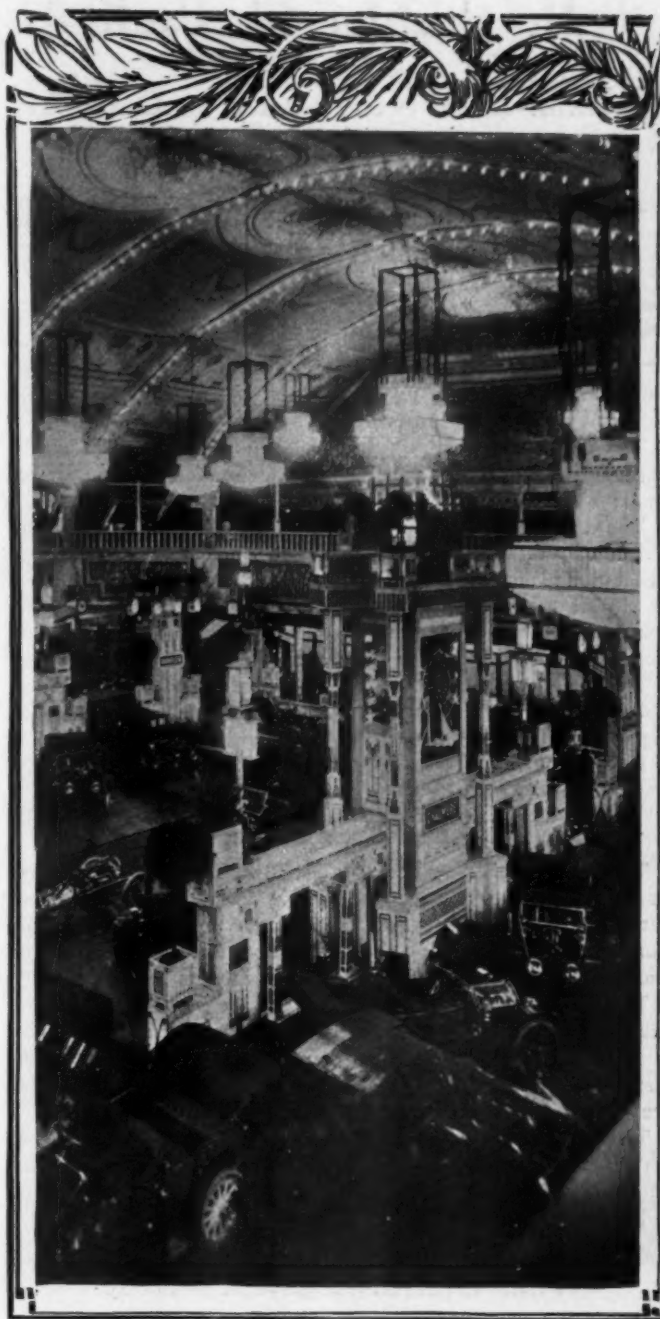
There are twelve makes of cars shown here at Chicago which were not to be seen in New York: These cars are the Austin, Glide, Colby, Davis, Cino, Cunningham, Kissell, Lexington, Republic, Staver, Halladay and Crow-Elkhart. Most of those have been accorded space in either the Annex or in the Armory on Michigan avenue.

New body types are very much to the front, and the endeavor has been in most cases to add as much comfort and room to the passenger-carrying space as possible. Running boards have been cleared to a large extent and in many cases the battery boxes are placed inside the frame, as well as the gas tank. Tires are carried in the rear in specially provided compartments, in a number of instances, among which the Knox and Columbia are leading examples. Economical distribution of chassis length has been striven for, and while not very strongly noticed this year there is certainly a leaning toward shortening of the unnecessarily long hoods on a number of cars. Makers are beginning to realize that wasting from 3 to 5 inches between the front end of the motor and a radiator is an extravagant waste of valuable space which might be accorded the car's occupant. Several are talking the abolition of the front fan and the placing of this part in the flywheel, thus making for less required front room. While it is not thought compatible with best practice to revert to former days and shorten the wheelbase, thus incurring the easy riding qualities of the machine, the tendency is to stretch the body out at both ends, so to speak. To this end the bodies are carried somewhat farther back beyond the rear axle.

Some Prominent Technical Features

As to technical features of note, the inswept frame on the dash forward has been gaining ground, as has the double drop frame. Left-hand control has many new adherents and the placing of the gear-shift levers in the center is also on the increase. Electric lighting has come to be looked upon as a standard feature and in cases where it is not part of the standard equipment the lamps are so constructed that it may be easily made a part. Self-starters are also very much in evidence, especially on the lower and medium-priced cars. Such makers as the Packard, Peerless, Knox, Thomas, Pierce-Arrow have held tenaciously to the old style manner of cranking. Any of these people, however, are willing to install a starter of any type if the customer so desires. All cars are elaborately equipped with tops, windshields, speedometers, horns, extra tires, tool kits, gas tanks and the like. The manufacturer who would sell his car no longer resorts to methods of extra adding. The car must be fully dressed to meet the requirements of a fastidious public.

Looking to the safety element in construction the Alco, Hudson and Thomas people in particular have provided a bracket below the propeller shaft so that in the event of its breakage



Looking diagonally over the Coliseum exhibits on ground floor

there would be no danger of its falling to the ground while the car is under high speed and thus causing the car to turn turtle.

The Lambert and Cartercar friction-drive machines are again among those present and each has its following.

The new-cylinder machines, such as the White, Everitt, Auburn, Imperial, Garford and Packard, are on show. In addition to these the Stoddard-Dayton Company has returned to the six in its Knight construction, the Locomobile Company has brought out a little six, the Mitchell shows a little six, the Pope-Hartford a new six model, and the Fiat a six-cylinder type new to the Chicago following, while this latter concern has been making six-cylinder machines for a number of years in Italy, their first appearance as bona fide American products is at the Chicago and New York shows. The Everitt, the White and the Fiat are the pioneers in the monobloc six field. The Austin machine, which embodies a number of radical changes from accepted practice, attracts a great deal of attention. The cylinders of the newest type of this car are set diagonally in order that the cams and the connecting rod ends may clear.

In the Legal Field

Klaxon-Ever Ready Suit on Calendar for February 15

Weed-Atlas Chain Case Progress—Muffler Patents to be Tested, etc.

SWEEPING in its terms was the injunction entered on behalf of the Lovell-McConnell Manufacturing Company and directed against the American Ever-Ready Company based upon the alleged infringement of the Klaxon basic patents by the latter concern.

The Ever-Ready company has replied to the injunction by giving formal notice of appeal from the findings of the United States District Court.

The injunction is framed in mandatory form as from the President and in substance prohibits the making, shipping, selling, advertising or exposing for sale any article of manufacture so similar to the Klaxon as to be capable of deceiving any person and also as far as the characteristic right-angled construction of the Klaxon horn is concerned.

The American Ever-Ready Company officially announces that it has great confidence in the ultimate outcome of the case and expects to go to another hearing in regard to this matter on or before February 15.

Weed-Atlas Case Has an Airing

The Weed chain suit against the Atlas Chain Company came up in a preliminary way before Judge Lacombe, of the United States Court, on Tuesday, on a motion for a preliminary injunction to take the place of the temporary restraining order that was issued at an earlier stage of the proceedings.

The matter was tried out in much detail along the lines usually followed by such proceedings. The defense introduced more affidavits and presented more statements of individual instances tending to show the antecedent state of the art than are ordinarily presented.

The attorneys for the complainants declare that there has been nothing radically new introduced to upset the patents. Judge Lacombe took the case under advisement and a decision is looked for next week.

Willis Ordered to Give Testimony

Taking testimony in the case of the Weed company against the E. J. Willis Company, of Boston, halted recently because of the objection raised to certain lines of testimony required of the defense. This testimony was with regard to the relation of the defendant company with some of its customers, and was objected to by counsel.

The United States Court was asked to rule on the matter and the decision was that this line of testimony is admissible and an order to that effect was made.

Muffler Patents to Be Tested

CHICAGO, Jan. 30—Patent suits probably will be filed within the next week by the Gray-Hawley Company against one of the large manufacturers of motor car specialties. The litigation will be based upon alleged use of the plaintiff's designs in catalog illustrations and text matter.

At least four different articles are claimed by the Gray-Hawley people to be direct infringements. These include a muffler, a muffler cutout and exhaust horn and cutout pedals designed and made by the complainants.

Baker Axle Patent Again in Court

The American Ball Bearing Company has instituted, in the District Court of the United States for the Northern District of Ohio, a suit to determine the question of infringement of Baker front axle patent No. 753,820 by the front axle constructions manufactured by the Metal Products Company, of Detroit.

S.A.E. Discusses Two-Cycle Motors

Opening the season of 1912, the Metropolitan section S. A. E. met last week to discuss two-cycle motors at the headquarters of the society at Forty-first street and Broadway. There were thirty-five members present, representing practically every prominent factory engaged in making motors according to the two-cycle principle.

Joseph A. Anglada presented the chief paper of the session, covering the history of the motor. H. L. Adams, of the Atlas company, made an address; E. L. Whittemore, of the Elmore company; J. R. Rogers, who is bringing out a new idea in the two-cycle line, and a number of others took part in the proceedings.

Franklin Officers Chosen

SYRACUSE, N. Y., Jan. 29—At the annual election of stockholders of the H. H. Franklin Manufacturing Company, and of the Franklin Automobile Company, officers were elected as follows: H. H. Franklin Manufacturing Company, president, H. H. Franklin; vice-president, G. H. Stilwell; secretary and treasurer, F. A. Barton; directors, H. H. Franklin, G. H. Stilwell, F. A. Barton, A. T. Brown, W. C. Lipe, E. H. Dann, John Wilkinson. Franklin Automobile Company, president, H. H. Franklin; vice-president, John Wilkinson; secretary and treasurer, F. A. Barton; directors, H. H. Franklin, John Wilkinson, F. A. Barton, G. H. Stilwell, E. H. Dann.

Horses Lose \$87,000,000 in Value

According to census figures just available, the value of the horses in the United States January 1, was \$87,000,000 less than it was at the beginning of last year. At the same time the number of horses increased 230,000 as compared with last year.

The figures show that the lessened use for the horse, owing to the progress of the automobile, has cut a big slice from his value, owing to the fact that the automobile has taken over a certain element of the horse's work.

On the other hand, the emancipation from so much hard work has had a tendency to prolong the life of the horse; hence the additional numbers.

It has been estimated that a few years of such progress will have the effect of lengthening the life of the average horse by at least 3 years.

Gasoline Up 1 Cent a Gallon

Gasoline delivered to garages is now 11 cents a gallon. The Standard Oil Company's new rate going into effect Wednesday raises the price 1 cent a gallon over the recent level and 2 cents a gallon as compared with the rate last summer.

The price of crude oil, upon which the cost of gasoline depends, has risen 20 cents a barrel within 2 months.

It is pointed out that the level of gasoline prices was 12 cents a gallon 3 years ago.

While the raise affects only the metropolitan district at present, it will probably spread as the crude oil price has advanced generally in the markets of the country to correspond to the price here and in the big oil exchanges of the country. If the retail price of all the gasoline used in American motoring is advanced to the consumer at the rate of 1 cent a gallon, the total daily excess cost of operation will be in the neighborhood of \$12,500.

Cameron Finances Hanging Fire

For over a month the Cameron Motor Car Company, of Beverly, Mass., has been successful in staving off bankruptcy proceedings. Back in December a petition in bankruptcy was filed in the United States District Court at Beverly on behalf of the Eisemann Magneto Company and other creditors. The claim of the chief creditor is in the neighborhood of \$2,500.

Ever since proceedings were commenced the Cameron concern has succeeded in gaining postponements of the ordinary procedure in such cases and, while motions for a receiver and for reference have been made from time to time, no action was taken.

The Cameron company has been making strong efforts to prevent a receivership until its officers can interest outside capital. In these efforts particular stress has been laid on the chances of the company rehabilitating itself if sufficient working capital can be secured.

Composition of all the claims against the company on a basis of 10 per cent. in cash has been suggested but has not met with acceptance on the part of several New York creditors, particularly the Eisemann and Bosch magneto concerns.

On Wednesday it was announced that the Cameron company had withdrawn its objection as to the bankruptcy proceedings at Beverly, it being stated that the proposed 10 per cent. composition of its liabilities had met with insufficient support on the part of creditors.

The court did not name a receiver or trustee but such action is expected by various New York creditors immediately.

Falcar to Be Continued

CHICAGO, Jan. 30—The manufacture of the Falcar will be continued, it is announced today at show. The Fal Automobile Company has been incorporated as a successor to the old Fal Motor Company, which went to receiver's hands last summer. The moving spirit in the new enterprise is Charles J. Marhoefer, brother of Edward H. Marhoefer, who was president of the Fal Motor Company, prior to its failure. Charles J. Marhoefer is president of the Fal Automobile Company and associated with him are F. C. Harbour as secretary and W. B. Paulson as manager.

It is the intention of the company to increase the capital stock and to manufacture about 200 Falcars for the season of 1912. The cars will be made in the factory at Princeton and Root streets, which was occupied by Fal Motor Company before it got into its legal entanglements. In this connection it might be stated that the Falcar plant for which the Coey-Mitchell Company is negotiating is not the one at Princeton and Root streets but is located at May and Lake streets, the original location of the Fal Motor Company.

Trade Credit Body Election

At the annual meeting of the Automobile Trade Credit Association, held in New York, Carl Kaufman, of the Motor Car Equipment Company, and Arthur Waterman, of the Hartford Suspension Company, were re-elected as directors to serve for 3 years, and U. S. Kolby, of the American Ever-Ready Company, was elected for 3 years, succeeding E. C. Wilcox, of the Connecticut Telephone & Electric Company. The hold-over directors are: W. O. Turner, Lovell McConnell Manufacturing Company; M. J. Martin, Geo. A. Haws; J. J. Cohn, Nonpareil Horn Manufacturing Company; F. A. Lemal, United States Tire Company.

At the meeting of the Board of Directors immediately following Mr. Cohn, senior member on the board, was elected president of the Association; W. B. Lasser (Weed Chain Tire Grip Company), first vice-president; M. J. Martin, treasurer; Franz Neilson, 80 Wall street, New York, secretary and counsel.

Two new members were elected: Waterbury Welding Works, Waterbury, Conn.; Marshall Oil Company, Marshalltown, Ia.

During the past 12 months sixty members were added.

Halladay Troubles Over

Company Given Clean Bill of Health in Chicago Court

Mortgage Bonds to the Amount of \$425,000 Issued— Two Creditors Object

CHICAGO, Jan. 30—The Streator Motor Car Company, Streator, Ill., was given a clean bill of health in court today by Judge Landis, this act being the final scene in the conferences of creditors which began last September. The Halladay interests represented by John C. Barlow and Paul R. Chubbuck recently filed a petition in court, notifying all of the Halladay creditors that if they were not satisfied with the plans of Messrs. Barlow and Chubbuck issuing mortgage bonds for 1, 2, 3, 4 and 5-year terms, they should file their objections in court.

In response to this petition only two creditors filed such objections. These have not been withdrawn and today's action of Judge Landis makes it possible for the company to have a clean financial sheet through the issuance of the mortgage bonds to the extent of \$425,000.

The Halladay company was started originally without capital, and operated entirely on credit. Too much business was attempted and, as a result, the company became hard pressed for ready money. To relieve this stringency two of its principal stockholders, John C. Barlow and Paul R. Chubbuck offered to convey to a trustee a large amount of real estate and other property, against which they proposed to issue bonds secured by a mortgage on the property so conveyed, and give these bonds at par to the creditors of the Streator Motor Car Company in payment for their claims.

These gentlemen attempted to do this without the assistance of any court, and secured the consent of nearly all the creditors. Two or three, however, would not agree to the proceedings, and for that reason Barlow and Chubbuck took the matter into the bankruptcy court; not for the purpose of being adjudicated in bankruptcy, but to enable them to present the same proposition as a composition in a court having authority to bind a minority of creditors.

Under the amendment of 1910 to the bankruptcy act, the court is given jurisdiction without an adjudication of bankruptcy to compel a minority of creditors to accept a proposition or composition acceptable to the majority. These gentlemen evoked the aid of the court for that purpose, and have now finally had the proceedings approved.

International-Lansden Merger Rumor

Rumors have been vigorously circulated during the past week that the Lansden company, of Newark, N. J., was about to be merged with the International Motor Company, thus giving that company an electric line in addition to its product of Mack and Saurer commercial wagons.

The rumors were denied as far as actually accomplished facts are concerned, but there was a reservation in the announcements made as to future possibilities.

It has been known since last spring that there has been a leaning on the part of the Mack company to take in the Lansden factory, but nothing developed at that time. After the consolidation of the Mack and Saurer companies, the talk was renewed and now comes the more or less detailed report that the merger is about to be accomplished.

Despite official denials it is likely that a statement will be made covering the facts in the case within the next week.

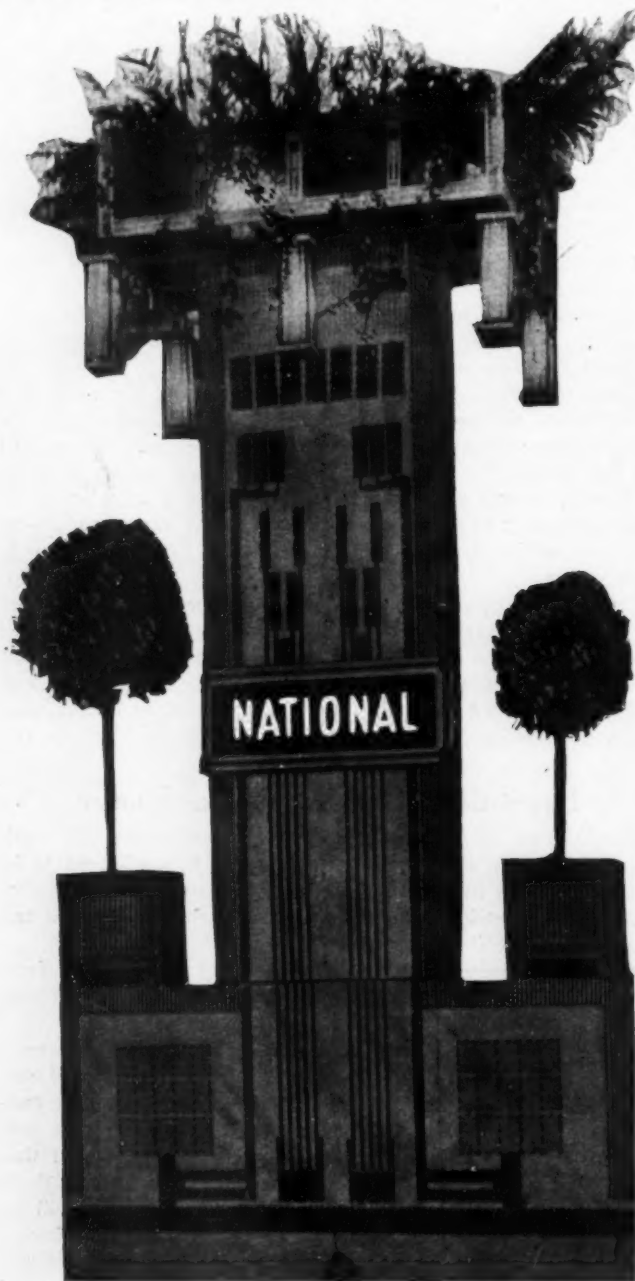
If this concern is merged with the International Motor Company the line will be most complete in that a full equipment of gasoline and electric cars will be carried.

Who's Who at Chicago

News Notes Gathered Between Times at the Big Western Show

Early Indications Point to the Busiest Fortnight in History of Great Exhibition

CHICAGO, Jan. 30—That the Coliseum show is a business show is the consensus of opinion of the majority of the representatives of the Chicago automobile manufacturers who are exhibiting here. Although the dealers' registration figures are slightly under those for the same period last year, about 2,000 have registered so far. The total number added for the day was 1,010. The slight falling off in the total is accounted for by the fact that an enormous crowd of dealers are holding off until later in the week in order to attend the first part of the truck section.



Decorative Mosaic pillar in Coliseum

The total general attendance for the three opening days has outdistanced that of the previous year for the same time by from 15 to 20 per cent.—according to S. A. Miles. Tonight the crowd was a large and interested one and every exhibit was receiving attention. The old-time gathering which swarmed back and forth down the aisles looking at the exhibits only with curiosity is markedly absent and the greater number of those who are here appear to have come for a purpose. Prospective buyers from such distant points as Winnipeg, Denver, Los Angeles and New Orleans have appeared with the idea of determining what make of car they will choose. All mean business and the whole atmosphere reeks with a genuine spirit of buying and selling.

A Stevens-Duryea representative stated that his organization believed this would be its banner year at the Chicago show. There are more people meaning business and fewer sightseers—one reason for this being that they come from longer distances.

The Winton sales manager goes on record as saying that his company always does more business at the Chicago show than at New York, this being attributed to the fact that the former city is more centrally located.

The Cole company has done more business the first 2 days here than it did during the entire week in New York.

Even as early as this, the Lozier concern has had a large number of its Western representatives and dealers on hand.

E. P. Chalfont, of the Thomas company, stated that in his opinion this present show will prove to be the greatest business affair of its kind on record.

The Buick company also has a large number of interested dealers in tow and its representative predicted banner show results and a big automobile year.

The Havers concern, which is holding forth at the La Salle, is another enthusiast at the year's prospects. All down the line the motoring public holds the city in its thrall.

Scores of others in the trade might be mentioned who have practically reiterated the foregoing statements as to the Chicago show's potentiality as a big selling agent, and as to the favorable outlook for the year's business.

Trade Changes Announced at Show

CHICAGO, ILL., Jan. 30—It is questionable if at any other show more changes in different companies take place than at the Coliseum exhibition here. It was announced here to-day that T. H. Mars, formerly with the Dart Manufacturing Company, Waterloo, Ia., has been appointed salesmanager of the Model Gas Engine Works, Peru, Ind.

The Kellogg Manufacturing Company, Rochester, N. Y., has opened a Chicago branch at 1430 Michigan avenue, under the management of Edward B. Reeser.

John Clark, formerly of the Clark Motor Car Company, Shelbyville, Ind., and who has recently withdrawn from this organization, has recently formed the Shelby Motor Car Company and is going to produce a four-cylinder car. No announcement has as yet been made of the personnel of the company, capitalization, etc.

J. L. Davidson, Indianapolis, Ind., formerly of the American Motor Car Company, and later connected with the Mais truck people, is bringing out a new car. A company will be formed, but no announcements have been made regarding its personnel or location.

J. C. Styles, manager of the Indianapolis, Ind., branch of the Warner Instrument Company, has taken the management of the new branch opened by this company in St. Louis, Mo., and has taken up his headquarters in that city.

The Pullman company has given its Chicago agency to the Owen H. Fay Company; J. V. Schenck will be the manager. At present it is not known exactly what location will be taken.

The Bird-Sykes, Chicago distributors of the Corbin and Matheson cars, have added the Inter-State to their line for the coming season.

News has just reached the show that articles of incorporation have been filed with the Indiana secretary of state for the General Industrial and Manufacturing Company, of the city of Indianapolis, which will manufacture a line of gasoline pleasure and commercial motor cars of 1000 to 1500 pounds capacity. The company has an authorized capitalization of \$1,000,000 and some of the wealthiest men in the city are numbered among the stockholders. The company expects to begin operations about March 1 and will take over the Industrial building at Tenth street and the Canal as a factory. This building is a four-story structure with a floor space of 360,000 square feet and modern machinery is to be installed. Directors of the company are: T. B. Laycock, secretary and treasurer of the T. B. Laycock Company, furnishing manufacturers; W. J. Mooney of the Mooney-Mueller Drug Company; Charles E. Coffin, president of the Central Trust Company; I. N. Richie, real estate broker; J. F. Lindley and E. W. Bowen, the latter a resident of Lebanon. Mr. Laycock has been elected president; Mr. Mooney, vice-president; Mr. Coffin, secretary, and Mr. Lindley, treasurer. Mr. Lindley is sales manager of the Laycock company. C. H. Wallerich, general sales manager Mais Motor Truck Company, has resigned and will take charge of the new company, which will be located in the Industrial Building, owned by T. B. Laycock.

The Board of Trade of Grand Rapids, Mich., has agreed to sell \$100,000 worth of the stock of the Decatur Motor Car Company on condition that the concern itself disposes of \$50,000 of it and that it removes its plant to the Michigan city. This transaction is expected to put the company on a firm financial basis. No definite information is yet at hand relative to the date arranged for the transfer of the concern from its present location at Decatur, Ind.

Windy City's Busy Week

New Deals, Business Changes and Items of General Interest

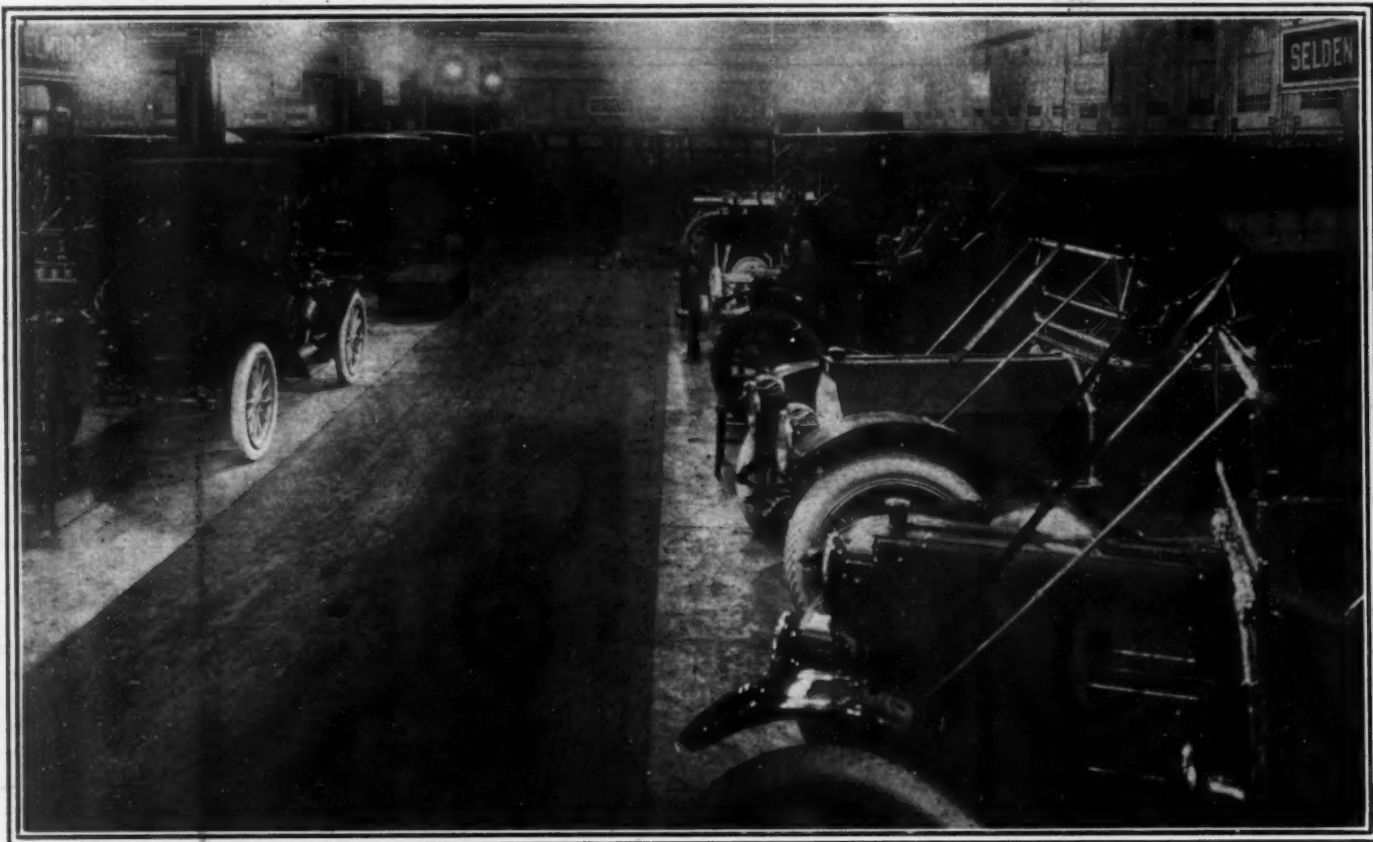
Social Side of the Show Has Not Been Forgotten — Personal News

CHARLES Y. KNIGHT, inventor of the Knight motor which is being exhibited by the Stearns, Stoddard-Dayton and Columbia people, is one of the daily visitors at the show, and is reminiscent of 6 years ago when he exhibited his sleeve-valve motor for the first time at a Chicago exhibition. Since then the motor has made wondrous strides. The Panhard company in France built 1,000 of this type last year and will produce 1,600 during the present year. Eighty per cent. of its product is of this design. The Mercedes Company in Germany, is turning out 60 per cent. of its product as Knight types. Its first motors were brought out a year ago, at which time a run of 500 was started.

This company is at present preparing to bring out two new models. The Minerva Company, in Belgium, makes the Knight type only, building 1,200 in 1911, and having plans for over 2,000 this year. The Daimler Company, in England, built over 2,200 in 1911, and has vastly increased plans for the present season. In Austria, Laurin and Klement have the rights for building this motor for Austria-Hungary and Russia. These rights have but recently been acquired. In Switzerland the Sigma Company has the Knight rights to build for the Swiss



General view of the interior of the First Regiment Armory



Car exhibits in the Coliseum Annex, on ground floor at entrance to main arena

market only. In Italy the rights are held by the Daimler company, of England, which has a small Italian factory. It is expected that soon arrangements will be made with two large Italian factories for manufacturing it on a royalty basis. In England, in addition to the Daimler Company, are one or two other concerns using the Knight motor. Mr. Knight announces that the statements that the Knight motor is to be manufactured by the Mason Motor Company, of Waterloo, Ia., the newly organized successor to the Maytag-Mason Motor Company, have no foundation.

One of the English visitors at the show is A. S. Hill, who is in America in the interest of the Coventry Chain Company, which concern brought out the silent chain when first used in conjunction with Knight motors for driving the eccentric shaft. This company is exhibiting for the first time in America a silent-chain gearbox, the chains taking the place of meshing gears. This construction has been introduced abroad in order to reduce noise in London and other cities. The American chain manufacturing companies have been quick to get in the field with silent chains for driving camshafts, magneto shafts and others, such concerns as Link-Belt, Whitney, Diamond, and others exhibiting the many sizes of these chains for every variety of drive in conjunction with motor cars.

Reeves Believes in Training Salesmen

Alfred Reeves, general sales manager and advertising manager of the United States Motor Company, is a firm believer in training salesmen for their work at the different shows. Before the New York show circuit opened every salesman who was to work in the exhibit spaces of the various companies in this holding corporation was given a thorough training in all the talking points of the cars. He was put through the rôle of selling the different cars to some members of the firm and if he could not succeed in doing this he was not considered eligible for the salesmanship force during the show. The necessity of such schooling has been apparent for many years past at the different shows. Scores of companies exhibiting have not looked

upon the shows as retail and agency propositions and have not fortified themselves with good forces of salesmen. The examples set this year by Mr. Reeves and others are good ones to follow by all concerns who are a little weak-kneed and feel that shows have outlived their usefulness.

Tacoma and Portland After Glidden Tour

Tacoma, Wash., has asked for the Glidden Tour and the executive committee has come to the Chicago Show, where a meeting will be held on Friday, of this week, to arrange all plans. The route outlined will end in the Rainier National Park on Mount Tacoma. The proposed route starts at Chicago and goes by way of Minneapolis to the Yellowstone National Park through the Columbia river valley and thence to Portland. Such a route would be the greatest scenic one possible in America. While Tacoma is interesting itself in this tour, Portland, Ore., has also been bidding for the terminus of this year's run and there are several manufacturers in the Coliseum show who are strongly talking in favor of the latter.

Big Dealers' Organization Projected

Another attempt to form a big dealers' organization was made yesterday when a representative lot of the retailers met at the Sherman House and organized the National Automobile Dealers' Association, officers of which have been chosen from the trade in Illinois and Iowa. R. S. Winegar, of Springfield, Ill., was chosen president; Julian Broehl, Pana, Ill., vice-president; E. A. Young, of Bloomington, Ill., secretary and treasurer. The directors' names are: L. F. O'Donnell, of Jacksonville, Ill.; Homer W. Wilson, of Carlinville, Ill.; D. F. Marquard, of Lincoln, Ill.; James G. Parker, of Maroa, Ill.; C. M. Jones, of Clinton, Ill.; A. H. Gain, of Roodhouse, Ill.; and M. Fitchford, of Granite City, Ill. The association is organized under the laws of Illinois for the purpose of fostering good fellowship, protecting the trade and to encourage the holding of motor car exhibitions. It is claimed that a membership of 1,200 has been secured. It is the intention to hold a banquet



Car exhibits along one of the side aisles of the Armory, under the balcony

during the week, at which time the campaign for membership will be inaugurated.

Another trade affair took place this afternoon when the Commercial Motor Vehicle Section of the Chicago Automobile Trade Association gave a demonstration of the utility of the power wagon. A fleet of motor trucks which represented local car dealers started from the Metropole Hotel, Twenty-fourth street and Michigan avenue, at noon and ran through the loop district, each truck being loaded to capacity. A record was kept of the gasoline and oil consumption and it is the intention to tabulate the results in order that a comparison may be drawn between the motor and the horse-drawn vehicle.

Indiana Makers Boom Product

CHICAGO, ILL., Jan. 31—The Indiana Automobile Manufacturers' Association, which has for its primary object the promotion of Indiana cars, will hold an informal dinner tonight at 6 o'clock at the Auditorium. All the officials of the organization will be on hand and plans will be discussed in regard to a tour later in the season as well as to the policy which will be pursued for the coming year. The officers of the association are: F. E. Smith, Maxwell-Briscoe, president; Will Brown, Mais Company, vice-president; George Weidley, Premier; H. H. Rice, Marmon; H. L. Smith, Premier; V. F. Whitesides, Whitesides Commercial Car Company, directors; Fred Coates, Lexington, treasurer; J. M. Ward, Waverley, secretary. The association had its beginning last year with the Four States Tour, which took in Illinois, Missouri, Iowa and Indiana. It is rumored that the organization is planning another tour to go through Wisconsin, Michigan and Minnesota.

Many Social Features Scheduled

The week of the pleasure car show is bristling with all sorts of dinner dates, most of them banquets arranged for dealers by car manufacturers. The crowning event in this line will be the annual feed of the Chicago Trade Association, which will be held at the Sherman House Thursday night, when S.

A. Miles will act as toastmaster. Among the speakers will be: Col. Charles Clifton, E. P. Chalfant, Hugh Chalmers, W. E. Metzger and others. Governor Deneen, of Illinois, has promised to be present, while Corporation Counsel Sexton will represent the city of Chicago. Other suppers arranged for include the Stearns dinner at 8 o'clock Wednesday night and the Halladay and Moon dinners after the show that same evening.

N. A. A. M. Attacks Freight Rates

WASHINGTON, D. C., Jan. 31—A general attack on freight rates on motor cars charged by the railroads throughout the country was made today in a petition filed with the Interstate Commerce Commission by the National Association of Automobile Manufacturers. Seventy railroad companies are named as defendants.

The claim is made by the complainant association that shipments made over the defendant railroad companies' lines are in carload and less-than-carload lots and that the transportation charges are not governed by special or so-called commodity tariffs, but are subject to the class rates of the individual or joint tariffs of the railroad companies.

The further claim is made that automobiles now constitute one of the largest items of traffic moving in carload lots handled by the railroad companies under classification rulings and without the benefit of special or the so-called commodity rates.

In asking the Interstate Commission to give it relief from the alleged excessive rates the association points out that damages in transit of motor cars are rare and that automobiles in 1904 were looked upon as the extreme of modern luxury, shipped in limited quantities. The complaining association asks the commission to require a hearing and that the defendant railroad companies be required to cease charging the present high rates and that the latter be further required to make reparation to the members of the association and any of its dealers who may have been injured by the alleged excessive rates.

Exports Rise; Imports Fall

Foreigners Bought Over \$20,000,000 Worth of Our Automobiles in 1911

WASHINGTON, D. C., Jan. 27—Over \$20,000,000 worth of motor cars were exported from the United States in the calendar year 1911, or twenty times as much as a decade ago. The exports to foreign countries last year, including tires and other parts, were valued at \$21,636,661 and the shipments to our non-contiguous territories, Hawaii, Porto Rico and Alaska, \$1,843,165. Ten years ago the exports to foreign countries were but \$1,069,782 in value; by 1906 they had grown to \$4,409,186; by 1910 to \$14,030,226, and the calendar year just ended had risen to \$21,636,661. This increase of \$20,000,000 in the exports of American-made motor cars within a single decade is one of the most notable achievements of our foreign commerce in years.

Meantime imports of motor cars into this country show a decreasing tendency. From 1902 to 1906, before the industry had developed in this country, imports rapidly increased, from about \$500,000 to \$5,000,000, the high record of imports of this class of vehicles. Since 1906, however, the imports have steadily decreased, last year's total having been less than \$2,500,000.

In 1906, according to the figures compiled by the bureau of statistics, the imports and exports of motor cars were of about equal value, imports into the United States in that year being \$4,910,208 and exports therefrom \$4,409,186. The following year witnessed a shifting of the balance of trade in motor cars from the import to the export side, since which time the excess of exports has steadily increased until in 1911 it was \$19,190,413, imports in that year having been but \$2,346,248 and exports \$21,636,661, or about nine times the value of the motor cars imported in the same year.

The aggregate value of motor cars passing through the ports of the United States during the last 10 years exceeded \$100,000,000. The approximate figures are as follows: Imports, \$27,000,000; exports to foreign countries, \$70,000,000; shipments to Porto Rico, Hawaii and Alaska, \$5,000,000, a total, for this comparatively new article of commerce, of \$102,000,000 in 10 years.

The rapid increase in exports of motor cars is in part due to the rapid development of the domestic industry, in part to the growing use of vehicles of this character throughout the world. In 1908 the exports of motor cars from France, the United States, the United Kingdom, Germany and Italy, the leading manufacturers of motor cars, aggregated \$45,000,000, and in 1910, but 2 years later, had grown to an aggregate of \$75,000,000.

France is the chief source of motor cars imported into the United States. Most of the cars exported from the United States go to British territory. The value exported to Canada in 1911 was \$7,180,547, or one-third the entire exports of this class of manufactures. To the United Kingdom the total last year was \$3,700,095; France, \$532,121; Germany, \$281,608; Mexico, \$794,559; British Oceania, \$1,362,902. To various other parts of the world, including South America, Asia, and Oceania, the exports of cars last year were large, in some cases the largest on record.

To Contest Findlay Bankruptcy

TOLEDO, Jan. 29.—A petition was filed in the United States court last week asking that the Findlay Motor Car Company, of Findlay, Ohio, be declared a bankrupt. The concern is now in the hands of John M. Barr, as receiver, and other creditors will protest the application.

Virginia Bill Aiming at Rum

Drastic Legislation for Chauffeurs Who Drive While Drunk

RICHMOND, VA., Jan. 27—The state legislature has been in session 2 1-2 weeks and only one bill affecting automobilists has been introduced so far. The measure was presented today in the House by Delegate Paul Bargamin, of Bedford County, which provides if anyone is convicted of running an automobile while under the influence of liquor he shall never again be allowed to operate an automobile within the boundaries of the State of Virginia.

The bill is fashioned somewhat after the traffic ordinance of Richmond which prohibits the operation of a car by a drunken chauffeur.

The text of the measure, which has greatly aroused Virginian automobilists, is as follows:

"It shall be unlawful for any person to drive or operate an automobile while under the influence of liquor.

"After conviction of any person for driving or operating an automobile while under the influence of ardent spirits, it shall be unlawful for such person to again drive or operate an automobile.

"Any violation of this act shall be a misdemeanor and punishable with a fine not exceeding \$500 or imprisonment for not exceeding sixty days, or both."

It is said that farmers whose steeds have been frightened by the fast running automobiles are supporters of the bill. There is not a little bitterness manifested by the agriculturists, who seem determined to push the measure.

Axle Tariff Interests Industry

WASHINGTON, D. C., Jan. 30—The revision of the metal schedules in the House of Representatives has created some warm debates, particularly in those sections of the schedule referring to reduction of import duties on axles, forgings and other parts used in motor cars.

The proposed 10 per cent. import duty on axles has created widespread interest. Members of the house have taken the matter up with many of the makers of motor car axles and invariably has come the demand for a higher schedule, many of the concerns declaring that it should be raised from 10 to 20 per cent. and that if the 10 per cent. schedule went into force it would place a great handicap on the American manufacturer because of the cheaper labor that is used in the shops of foreign countries.

Section 19 of the schedule refers specially to axle parts and reads as follows:

19—Axles or parts thereof, axle bars, axle blanks or forgings for axles, whether of iron or steel, without reference to the stage or state of manufacture, not otherwise provided for in this act, or in the first section of the act cited for amendment, 10 per cent. ad valorem; provided that when iron or steel axles are imported fitted into the wheels, or parts of wheels of iron and steel, they shall be dutiable at the same rate as the wheels in which they are fitted.

Board Against Yearly Models

Yearly models are passing away, according to a review of the current catalogues of automobile makers. The argument has again been put forward that there is as much reason to describe a carriage as a yearly model, as there is an automobile. During the last quarterly meeting of the Automobile Board of Trade a motion was made to the effect that it was the sense of the meeting that yearly models should be discontinued. This was adopted.

No rule has been laid down under the motion, but the new catalogues show that many manufacturers fail to mention the year while describing new models in much detail.

C. G. Stoddard Resigns

Will Leave United States Motors and Build Cars Under Knight Patent

CHICAGO, Jan. 31—C. G. Stoddard, vice-president of the United States Motor Company, has resigned from this organization, with which he has been associated since its incorporation with the Dayton Motor Car Company, and is about to organize a new company to build pleasure and commercial cars equipped with the Knight sleeve-valve type of motor.

H. J. Edwards, who recently resigned as chief engineer with the United States Motor Company, will go with Mr. Stoddard into the new company, and the new machines, of which two pleasure car models will be produced, will come through as a product of his skill. Mr. Edwards was engineer of the Dayton Motor Car Company and developed the well-known Stoddard-Dayton cars.

Mr. Stoddard's resignation as the first vice-president of the United States Motors was purely a business proposition. He, in company with Mr. Edwards, had an option on the fourth American license to build cars using the Knight type of motor and he considered this option a good opportunity—too good a one to be passed by. He continues as a director of the United States Motor Company and his resignation will not affect his holdings in this corporation.

Orrin S. Goan succeeds him in the position of first vice-president and also as chairman of the operating council, which position Mr. Stoddard held. J. W. Stoddard, father of C. G. Stoddard, who was recently elected a member of the board of directors of the United States company, also continues as a director. Mr. Goan has for several years been associated with the National Biscuit Company and entered the United States Motors about three months ago.

The personal withdrawal of C. G. Stoddard will not in any wise affect the position of the Dayton Motor Car Company in the United States Motors. Several reports have been current here during the show that there was to be a withdrawal of the Stoddard company, but these are not true.

The new company which Messrs. Stoddard and Edwards will head, it is understood, will be known as the Edwards Motor Car Company. This is not confirmed, but from rumors it is probable that this will be the name finally chosen for the new organization.

The new Edwards Motor Car Company will also bring out a line of commercial vehicles of different load-carrying capacities, all of them being fitted with Knight types of motors.

Hupps Forbidden to Use "Hupp"

DETROIT, MICH., Jan. 31—Judge Murphy has handed down a decree in the Wayne County Circuit Court restraining R. C. Hupp and L. G. Hupp from using the word "Hupp" in their corporate name. This injunction was brought by the Hupp Motor Car Company with which the Hupps were formerly connected. In pursuance with this decision the name will be changed from Hupp Corporation to R. C. H. Corporation.

Overland Not to Absorb Reo

CHICAGO, Jan. 31—The rumors which were afloat regarding the purchase of the Reo Motor Car Company, Lansing, Mich., by the Willys-Overland Company, Toledo, Ohio, were set at rest today by a statement by John North Willys in which he said that negotiations were entirely off. The matter had progressed little farther than some conferences between legal representatives of the two concerns and had not reached the stage of price or other details.

N. A. A. M. to Run Show

Only One New York Exhibition Next Year, Under Association's Direction

CHICAGO, Jan. 31—At the annual meeting of the National Association of Automobile Manufacturers today, all of the old officers were re-elected but William R. Ennis, treasurer, who asked to be relieved. His place was filled by H. S. Rice, of the Waverley Electric Company, of Indianapolis, Ind. William E. Metzger, of the Metzger Motor Car Company, of Detroit, will continue as president for the coming season and his corps of assistants are as follows: First vice-president, Benjamin Briscoe, United States Motors, New York; second vice-president, H. O. Smith, Premier Company, Indianapolis, Ind.; third vice-president, S. T. Davis, Jr., Locomobile Company, Bridgeport, Conn.; secretary, R. D. Chapin, Hudson Company, Detroit, Mich.; treasurer, H. H. Rice, Waverley Company, Indianapolis, Ind.; general manager S. A. Miles, New York; assistant general manager, J. S. Marvin; counsel, Charles Thaddeus Terry.

The chief work of the meeting was the discussing of 1913 dates for New York and Chicago shows. The New York show will begin Saturday evening, January 11, 1913, and will continue for 2 weeks. This is a week later than formerly and has been done to get as far away from New Year's Day as possible. The Chicago show date has also been moved on a week and instead of opening the last Saturday in January, will open the first Saturday night in February.

After over an hour of formal and informal discussion on the New York show situation it was generally considered that there will be but one show in New York next year, and in all probability the higher control of it will be by the National Association of Automobile Manufacturers. As the majority of the car manufacturers in the country are now members of the N. A. A. M., it is but natural that this body should be the controlling one in the show situation. Nothing definite is known as to where the show will take place. It is not even known whether Madison Square Garden will be torn down before that time, or if the new Grand Central Arena will even be in course of construction. No matter what the building situation may be, the National Association will cope with the matter of one show and giving representation to all.

A most important factor in today's meeting was the decision to perpetuate the valuable commercial vehicle department work which the association has been conducting since the start of commercial vehicle shows. Lists of over 40,000 names have been compiled showing concerns of different financial standing. Other lists containing thousands of names of chiefs of police, fire and other departments in the different cities have been compiled and the most valuable work has been done.

The association is also actively working on the matter of contests, and is going to use its influence to aid those contests that are for the betterment of the industry and to discourage those that are of little permanent value.

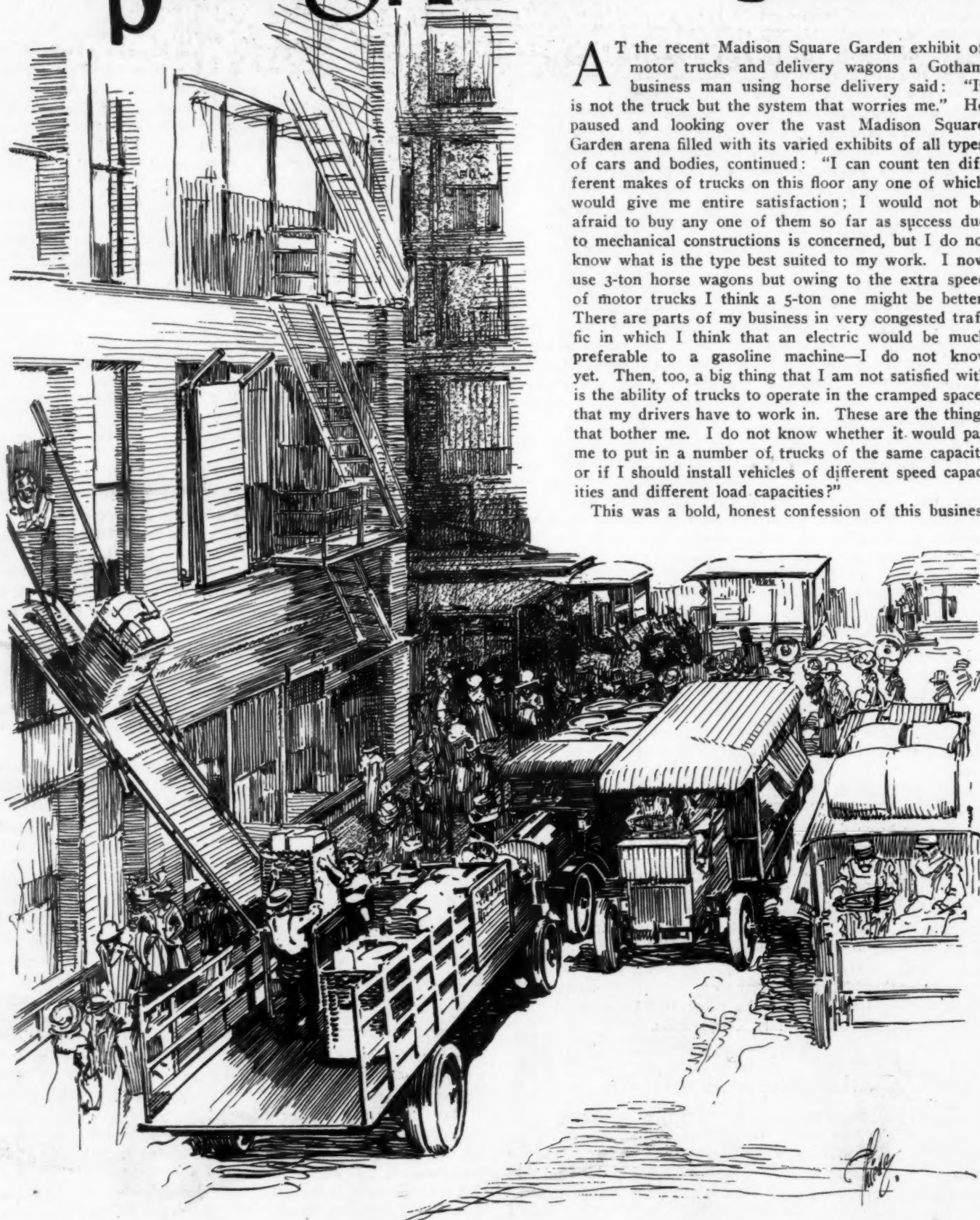
In conjunction with the commercial vehicle business, the association is bringing to the attention of its members the necessity of better loading and unloading facilities in cities and towns and at railway depots, steamship piers and other places. The matter of discounts to agents also came up for consideration.

One important step in dealers' insurance policies was accomplished so far as the New York dealers are concerned. Up to the present the insurance underwriters have required every dealer to enter in a book the number of each car taken into his establishment and should he fail to have entered a single car and his stock was destroyed by fire, the policy becomes null and void. Under the improved arrangements the policy will only become void if it can be shown that the neglect of entering the car in the book was wilful.

Saving Minutes and Dollars

AT the recent Madison Square Garden exhibit of motor trucks and delivery wagons a Gotham business man using horse delivery said: "It is not the truck but the system that worries me." He paused and looking over the vast Madison Square Garden arena filled with its varied exhibits of all types of cars and bodies, continued: "I can count ten different makes of trucks on this floor any one of which would give me entire satisfaction; I would not be afraid to buy any one of them so far as success due to mechanical constructions is concerned, but I do not know what is the type best suited to my work. I now use 3-ton horse wagons but owing to the extra speed of motor trucks I think a 5-ton one might be better. There are parts of my business in very congested traffic in which I think that an electric would be much preferable to a gasoline machine—I do not know yet. Then, too, a big thing that I am not satisfied with is the ability of trucks to operate in the cramped spaces that my drivers have to work in. These are the things that bother me. I do not know whether it would pay me to put in a number of trucks of the same capacity or if I should install vehicles of different speed capacities and different load capacities?"

This was a bold, honest confession of this business

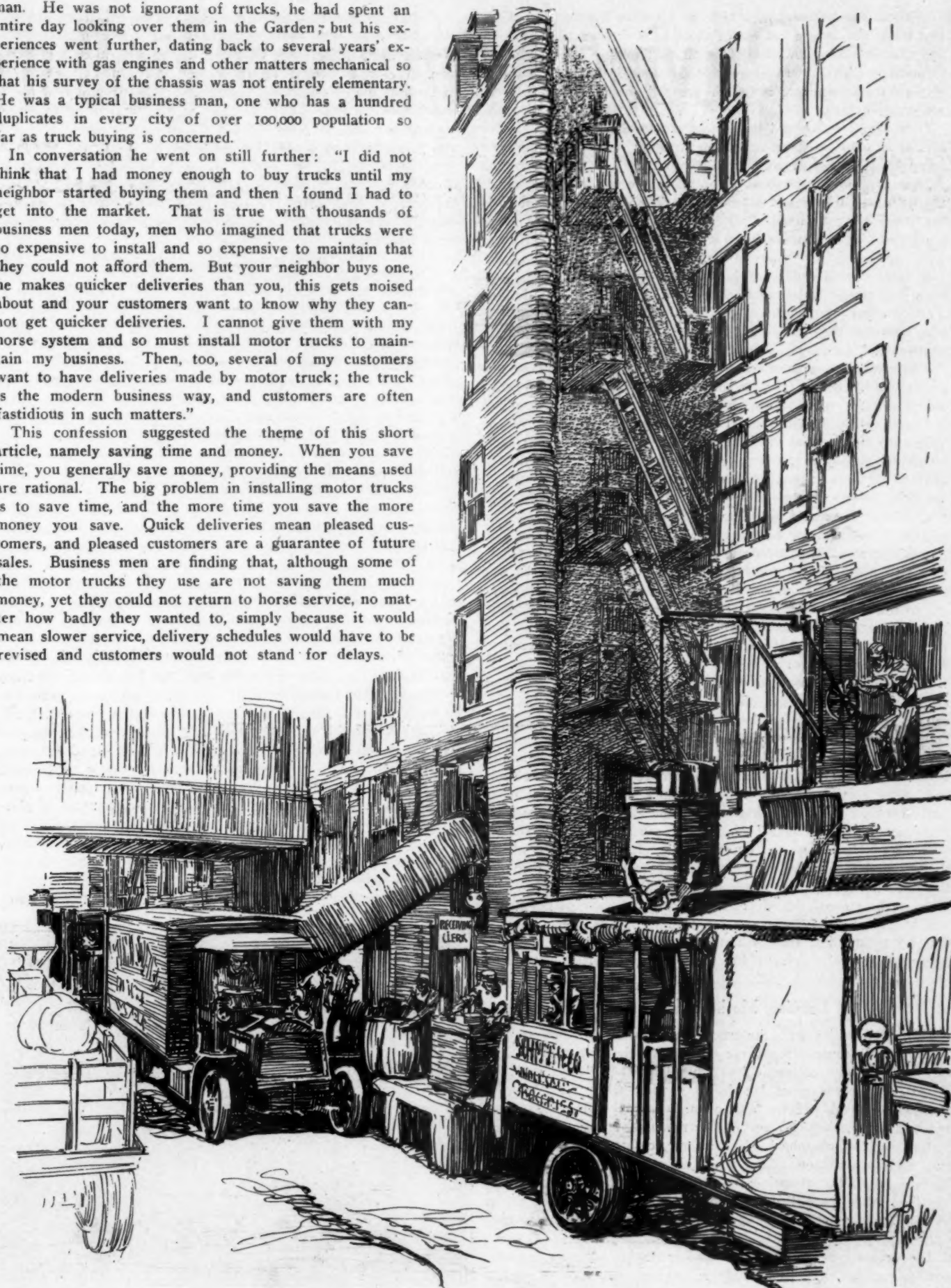


With overhead loading systems sidewalk traffic is not interfered with and time is saved by the quicker loading

man. He was not ignorant of trucks, he had spent an entire day looking over them in the Garden; but his experiences went further, dating back to several years' experience with gas engines and other matters mechanical so that his survey of the chassis was not entirely elementary. He was a typical business man, one who has a hundred duplicates in every city of over 100,000 population so far as truck buying is concerned.

In conversation he went on still further: "I did not think that I had money enough to buy trucks until my neighbor started buying them and then I found I had to get into the market. That is true with thousands of business men today, men who imagined that trucks were so expensive to install and so expensive to maintain that they could not afford them. But your neighbor buys one, he makes quicker deliveries than you, this gets noised about and your customers want to know why they cannot get quicker deliveries. I cannot give them with my horse system and so must install motor trucks to maintain my business. Then, too, several of my customers want to have deliveries made by motor truck; the truck is the modern business way, and customers are often fastidious in such matters."

This confession suggested the theme of this short article, namely saving time and money. When you save time, you generally save money, providing the means used are rational. The big problem in installing motor trucks is to save time, and the more time you save the more money you save. Quick deliveries mean pleased customers, and pleased customers are a guarantee of future sales. Business men are finding that, although some of the motor trucks they use are not saving them much money, yet they could not return to horse service, no matter how badly they wanted to, simply because it would mean slower service, delivery schedules would have to be revised and customers would not stand for delays.



The overhead loading system must come—the individual crane for crate work and the chutes for lighter work

While many business men believe in trucks they do not think that they can make a success of them in their own business. In one case it is the slow loading methods that are antiquated and in another case it is the freight depot work. A third example is poor traffic control; a fourth are bad pavements; and there are many others.

Delays in loading and unloading are fatal. A few examples will show why. There is one department store in a big city using four-horse wagons which take on loads in the alleys and deliver to suburban sections. The alleys are congested, so much that it takes 28 minutes from the time the horse wagon reaches the alley entrance until it is finally backed up at the loading platform. Then it must wait until the load is on and further waits are caused by delays in getting out of the alley.

A motor truck could not possibly be made to show up well when operating under such conditions; it costs many dollars more per year to keep a 5-ton truck waiting 1-2 hour at the alley twice or four times a day than it does a horse wagon of similar load capacity.

There must be a solution of this problem, and it is only one of a score of similar troubles that beset the normal operation of motor vehicles for business uses. The reform must take place in the alley, a different design of truck body will not help much. When the reform has to be made it becomes more or less of a municipal proposition. A policeman might be stationed in the alley, if he were competent to control traffic it would be one of the best investments possible to the business houses who use that alley. It would pay such business interests to pay the salary of such a city official. Traffic delays in alleys are deplorable affairs; they are occurring all of the time. One teamster will not wait on another, there does not seem to be any thought of co-operation among them. It does not seem to occur to the drivers that a part of their duty should be to employ their time to the greatest advantage of their employer. But rarely do they feel that way. Congestion is such an excellent excuse; it always works.

There are several ways of remedying the congestion. The easiest is controlling the alley traffic. One or two policemen can do this. The city police have by sheer necessity been compelled to regulate street traffic in regions of extreme congestion, solely because business demands it. Today business demands better traffic control in alleys and cramped streets in wholesale and other sections. The care for traffic on streets has been pushed ahead by the pedestrians. They demanded some improvement. People using vehicles for pleasure also demanded traffic control, and so the cities installed it. But in the alleys the demand is not made so loudly, it is not preached through the columns of the daily press, it is not talked in the club. The alley is the stronghold of the driver and in many places he is not a reformer. Less congestion to him means more loading and unloading and that is more work. As a result we can never look to the drivers for a solution of delays caused by alley congestion.

Loading Methods Important

The solution lies with the truck dealer, and the truck maker. These people must bring these matters to the attention of the city bodies. The economic loss caused by such delays must be shown. Concerns must be shown exactly what they lose by such lax control. If the city council or the police cannot be reached direct, they can perhaps be reached through other civic bodies, such as chambers of commerce, clubs, etc. This traffic is a civic proposition. Like other civic propositions, it has to be brought to the attention of the proper authorities and it is not likely that the police and other departments will take it up, as it will mean larger appropriations, a delicate problem in city politics.

The greatest delay in alley traffic is due to obsolete loading and unloading methods. There is scarcely an alley in which the loading and unloading is not done from the rear of the vehicle. With horse wagons the vehicle is placed nearly at right

angles across the alley and often there is not room enough left for other vehicles to pass. As a result the driver unloading has to shift his position once or twice during an unloading operation. We are in need of improved methods. One of the simplest of these is the overhead loading scheme. This is not new but it is not much in use. There are one or two firms using overhead loading schemes in New York and one in Chicago. This system is specially applicable for street work, where the merchandise has often to be moved across a crowded sidewalk, in which the work of the loaders is very much hampered. The overhead loading system rectifies all of this. There is not any delay to the pedestrians and there is much time saved by the truck loaders.

Canvas Chute System Simple

One of the simplest loading systems for street level work is the canvas chute. This is used by the motor vehicles of the New York postoffice at the Thirty-ninth street station. The mail bags are slid from the second story down a canvas chute which at its lower end hooks onto the rear end of the truck. The mail slides right into the wagon, and there one driver can catch the bags as they exit from the chute, and put them in place. Such a system is very economical. The canvas chute is cheap, and it does not mar the outer appearance of the building in the slightest. It fastens into a window, and when the window is raised the chute is dropped to the wagon.

Such a chute as this could be used by a score or a hundred of business houses in nearly all of the big cities. It would give quicker loading methods and would save money. The installation would not cost so much as building a movable loading platform. The economy consists in time saved. A package can travel from the warehouse to the wagon much quicker by chute than by workman. The workman is often delayed by sidewalk passengers, so that all told there is not any comparison between the overhead chute method and the hand-loading scheme.

But there are other loading methods than the chute. True that to date they have not come into use, but there is not any reason why they cannot be used. For alleys a score or more can be used to advantage. The crane is one of the simplest. It is well suited for second floor work. It consists of the swinging framework, with the hand pulley. This is well suited for crate delivery, where six or seven crates would make a 5-ton load. The crane can handle one crate at a time, and time so spent would be short as compared with hand loading from a platform on the ground floor. A still further advantage of the crane is that it reduces the amount of handling when loading. The crate can be swung back or forward into its final place in the truck, reducing the labor of the loader over 100 per cent.

A third practical example of overhead loading for alleys and



Under balcony at north end of Coliseum

also for street levels, is the toboggan slide, illustrated on a previous page. This is at present used for sidewalk level unloading. Some of the biggest wall paper concerns slide the goods into the basement by such slides, and they can be loaded onto the wagon again with equal facility from an upper floor. The internal system of such houses is that these rolls are invariably taken to upper floors on freight elevators.

Overhead Loading Widely Applicable

But the toboggan overhead loading devices are not by any means limited to wall paper houses. There is scarcely a business house handling medium-sized lines by which such a system could not be used. The employment of a rope to hold the crate from travelling too fast is illustrated on the opening page. Such is an entirely rational device. Barrels and large crates could be readily handled in this way. In fact there are over a thousand different uses to which such a loading scheme could be used. In every case time would be saved, the energies of workmen would be conserved and by so conserving their energies, it would be possible to have them work at a faster pace. When a workman has to exert all of his power lifting heavy crates onto a wagon it is certain that his subsequent movements are going to be very slow. Reduce the amount of his physical labor and you can hasten his movements. This will mean money to the employer at the end of every month.

But there are many additional advantages of overhead loading in alleys. It is the great time saver. It doubles the capacity of loading platforms. With overhead loading it would be possible for one wagon to be loaded from the ground floor and also from the second floor at the same time. This is not any utopian conception; it will be a reality within a couple of years. You can go further; you can be loading one vehicle at the ground level platform and loading another vehicle which is standing out farther in the alley, using a chute or some other means. Gravity is the cheapest force in the world and it must be taken advantage of.

This is the twentieth century. The motor truck is a twentieth century load carrier, but you cannot make a success of it unless you use twentieth century means to load and unload it. The old idea of of hand loading is bound to pass. Individual and city economy will demand it. The fact that the driver has ruled master of ceremonies in the past is no reason why he must always rule. If there is one thing that demands attention it is this antiquated alley autocracy. Truck dealers would be making a better investment if they were familiarizing themselves with such abuses rather than busying themselves knocking the other maker's type of truck or delivery wagon.

This truck selling business is a thousand times bigger than half of the truck salesmen who are trying to interest business

men in their particular make of vehicle. The ordinary salesman has not the vaguest conception of the real situation. He talks lubrication, and overhang, and speeds, and gasoline consumption, and oil consumption, but many of these are trifles light as air compared with the big problems which are cutting down the usefulness of trucks today.

Look to the railroads as an example of what must be done in a municipal way when it comes to getting the best that there is out of transportation. What would be the situation in Chicago today if all of the entering railroad lines had street level crossings? It would be impossible for the fast trains to maintain schedules, local trains for suburbanites would lose all of their profits. The railroad companies have had to elevate their rights of way.

Local transportation companies have had to elevate their lines or build subways in order to meet the demands for faster personal traffic. But while we have been riding in subways, in elevated steam lines and in elevated electric lines, what has been happening in the truck and business field? Nothing. Our horse trucks are moving about much as they did a century ago, excepting where the police control makes obedience imperative. It has been necessary to build special lines to cut down time for the people getting to and from work, but nothing direct has been done to hurry up the coal teamster, the brewery delivery man or the truck teamster. Many things might have been done. Entire streets might have been set aside for heavy truck traffic. Traffic might have been forced to go in but one direction along certain narrow streets. This has not been done. Even in narrow alleys the antiquated methods rule. All is against the truck, all cut down its earning capacity, all make it harder for every salesman to get repeat orders, all are against the progressive spirit of the times. A change must be made. There must be more control of traffic in alleys and cramped business streets. If the city police do not take it up then truck associations should be formed, and they should bring it to the attention of the correct parties.

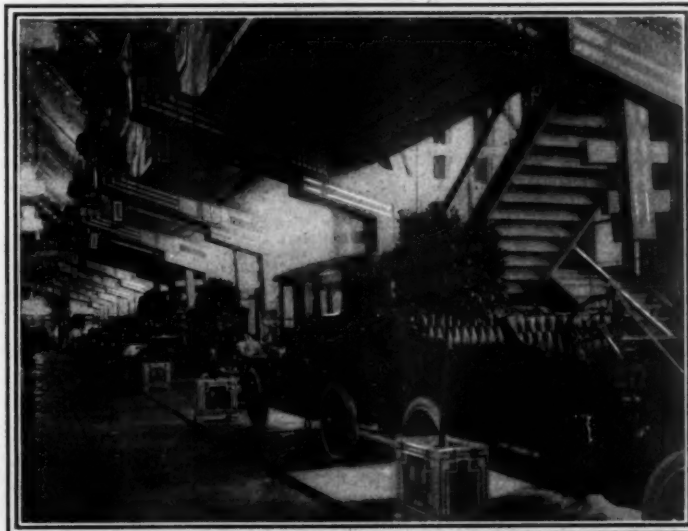
Many cities have local organizations of tradesmen in the automobile business. In some places they waste their time on irrelevant missions, but what is needed ten times more is the truck organization. Truck manufacturers should see that they foster the formation of local organizations in cities of over 25,000. Such organizations should make a study of local conditions which are not favorable to truck operation. Such organizations should interest the local governing bodies in such and progress will result.

Operating Conditions Must Be Favorable

After all when you go through the entire truck industry and boil everything down to bedrock, it is system of handling goods, and traffic that counts more than the truck. What use is a steam locomotive to a farmer? What use is a 10-ton truck to a big business man if he has not alley loading and unloading facilities and if the traffic is not controlled on the streets so that the vehicle can make its required speed? How much faster is a 200-horsepower racing car on a crowded city street than an 8-horsepower runabout? The vehicle is not absolute, it is subject to its environments. The truck will not attain its success unless we make the conditions for its operation favorable.

The freight has to be transported by hand. The methods of the ox team have not been improved upon. The truck engineer has done nobly within the last year; the new concerns are producing very creditable vehicles, they are all looking for big sales and big business, but they must look after the conditions.

All of truck selling is not a salesroom proposition. The employment of the transportation expert is very essential. Some leading truck concerns are already doing this and they are doing a grand missionary work for the entire industry. They deserve to reap the harvest themselves, but their work is so broad and so educative that it will be valuable to the entire industry. Let others help on in this direction.



Giving an Idea of Mosaic decoration under Coliseum balcony

Statistics of Commercial Car Industry

Last Year Witnessed Phenomenal Growth—Bright Prospects for Future

INDUSTRIES, like everything else, must have a beginning, and the automobile truck industry is no exception to the rule. But it is evident that it is rapidly outgrowing the period of childhood in spite of the custom, so generally followed, of referring to it as still in its infancy. The truth of the matter is that the truck industry in this country had its inception more than ten years ago and has been growing up, rather quietly, beside its big brother, the pleasure automobile industry. However, it is only in the last year or two that the public in general, and particularly the business world, has begun to turn its attention to the automobile truck as a practical time, labor and money saver. Now, from all indications and in view of the phenomenal development which has taken place recently, the truck industry will soon be a rival of the pleasure car branch of the trade. For the past few years special shows, devoted entirely to exhibits of commercial cars and their accessories, have pointed out the increasing interest taken in these things, whereas formerly commercial vehicles, if shown at all, were treated more as incidentals than as important exhibits deserving to be placed side by side with the pleasure car.

In the year just passed the motor truck industry has taken the first really great stride in the wonderful advance which it is apparently about to make. There were 23,855 commercial cars registered in the United States during the year, as is shown in the accompanying table. These consist of about

18,655 gasoline trucks, 4,600 electric vehicles and 600 fire department cars. There are some steam commercial cars, but they are so few that they may be ignored.

Considering the population of the United States as 90,000,000, there is at the present time one truck in use for each 3,800 people in the country. It is readily seen that there is a big field for the commercial car when the variety and multiplicity of its uses are taken into account. With these in view 3,800 persons to one truck seem a great many. During the coming year, however, the manufacturers are planning to turn out 45,000 trucks. These, together with those now in use, will bring the total for 1912 up to 68,835, which means one truck to every 1,300 persons in the country. It will not be many years before the ratio will be about 500 persons to a truck. An important factor to consider in this connection is the long life guaranteed to a truck by the general solidity and strength of its construction.

When the industry was really in its infancy, say in 1901, when less than 100 trucks were manufactured in the whole country, the average price of commercial cars was rather low, as they were mostly only light delivery wagons, crudely put together. For instance, the average price for the year 1902 was \$1,400. In 1903 the quality and size of the vehicles produced were slightly improved and the average price rose correspondingly to \$1,450. In 1904, as is shown in the diagram at the end of this article, the rise continued, the price going to \$1,500. Thus the average price continued to rise steadily until 1910, when it reached its high-water mark at \$2,250. The greatly increased production in this year and the high percentage of low-priced light trucks and delivery wagons brought the average price down to \$2,200. In 1912 it will drop to \$2,100, in all probability, as the number of manufacturers devoting themselves to the building of small trucks indicates a marked preponderance of that class of vehicle in the total of the year's production.

Production Rapidly Increased

In regard to production, it is interesting to compare the output of motor trucks year by year since the beginning of the industry. The curve on page 365 shows graphically how the first few years, when the makers were experimenting, were not remarkable for the number of vehicles turned out. The sharp upward sweep of the curve about the year 1908 marks the time when experiments were a matter of the past as far as the important features of design and construction were concerned and the manufacturers began to market cars which embodied the results of the study of the previous years. In 1903, as the curve shows, only 175 trucks were made, as compared with 400 in 1904. The first good year for the industry, however, was 1905, when the production jumped to 650. Interest in trucks fell off a little in 1906, largely because many of those who had purchased them operated them in a slipshod way and found them more expensive than horses and wagons under the same conditions. Things became better, though, in 1907, as the truck owners began to realize that, to make their trucks pay, system was a prime necessity. It looked like a boom year, but the panic came along and kept the production down to 1,700. In the first few months of 1908 the effects of the recent panic were still to be felt, but business gradually picked up and the latter part of the year was marked by a brisk activity in the truck industry which brought the output up to 3,000 vehicles and led to its first really great year. This was 1909, when the produc-

COMMERCIAL CAR REGISTRATION AND ESTIMATED FEES
FOR 1911.

State and Territory.	Registration.	Fees.
Alabama	39	\$ 195
Arizona	14	70
Arkansas	43	215
California	2,063	10,315
Colorado	14	70
Connecticut	482	2,410
Delaware	79	395
District of Columbia	110	550
Florida	94	470
Georgia	136	680
Idaho*	24	...
Illinois	1,626	8,130
Indiana	1,442	7,210
Iowa	1,094	5,470
Kansas*	115	...
Kentucky	103	515
Louisiana	43	215
Maine	100	500
Maryland	98	490
Massachusetts	2,120	10,600
Michigan	1,226	6,130
Minnesota	963	4,815
Mississippi	36	180
Missouri	232	1,160
Montana*	36	...
Nebraska	242	1,210
Nevada*	24	...
New Hampshire	78	390
New Jersey	1,061	5,305
New Mexico*	29	...
New York	5,081	25,405
North Carolina	76	380
North Dakota	46	230
Ohio	871	4,355
Oklahoma	32	160
Oregon	126	630
Pennsylvania	2,062	10,310
Rhode Island	162	810
South Carolina	106	530
South Dakota	112	560
Tennessee	103	515
Texas	347	1,735
Utah	32	160
Vermont	75	375
Virginia	120	600
Washington	116	580
West Virginia	51	255
Wisconsin	543	2,715
Wyoming	28	140
	23,855	\$118,135

*Estimated; registration not required.

tion jumped to 6,500, and people began to manifest an eager interest in the making and use of commercial vehicles, which has been increasing ever since. In 1910 the confidence of the manufacturers in their products was shown by the turning out of 13,000 cars, and last year's tremendous output of close to 25,000 trucks seems to amply justify their confidence.

As the old saying goes, "money talks," so it may give a better idea of the magnitude of the industry to consider some of the values involved in its various branches. At the average price of trucks for 1911 the commercial cars now in use represent the investment of \$52,481,000. On the same basis the value of the output of the American truck makers for the year 1911, including the cars on which work was begun in that year, amounts to \$55,000,000. The production predicted by the manufacturers for 1912 at the same average price will come to the amazing value of \$99,000,000. The factory buildings and equipment of the companies engaged in the manufacture of automobile trucks are assessed at figures which total over \$35,000,000, without including the factories of a number of firms which rented their factories, and sometimes their equipment, and could not supply the figures representing the value of these. Some of the companies manufacture both pleasure and commercial cars, though many of them devote their entire factories to the making of trucks.

Factories Employ Many Men

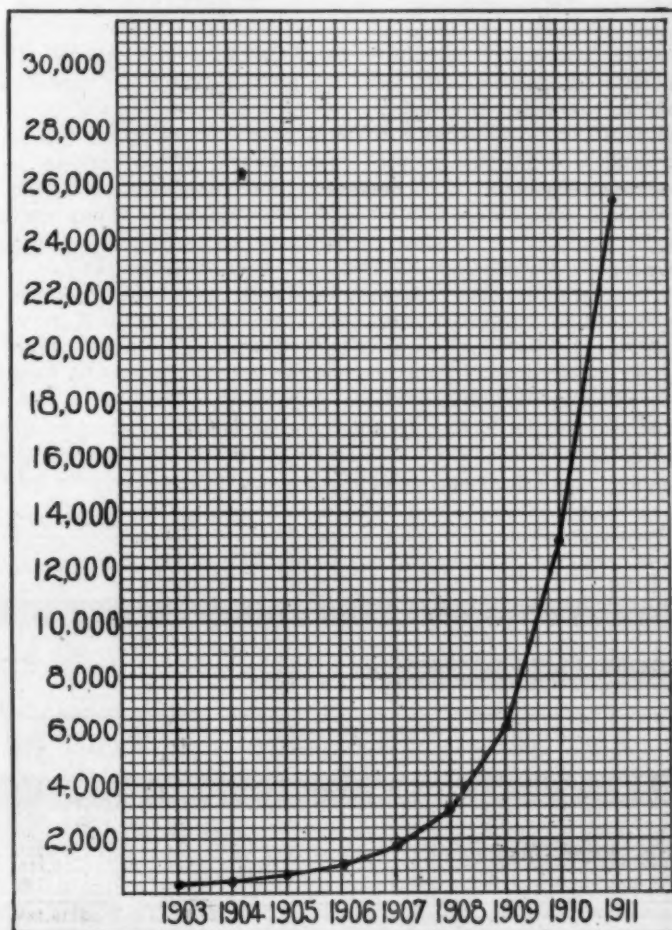
The number of men employed in factories which manufacture commercial vehicles varies all the way from eight or ten in some small plants to 10,000 in some of the great establishments which turn out a total of several thousand pleasure cars and trucks a year. The clerks and officials engaged in the factory branch of the industry would make several good-sized regiments, and their salaries, added to the wages of the 50,000 men employed in the works, make up the tidy sum of \$65,000,000 a year.

The extensive use of automobile trucks has created a large demand for truck accessories, just as the pleasure car business gave rise to the manufacture of accessories for pleasure cars. However, comparatively few new manufacturers have entered the accessory field on this account, as the majority of the makers of pleasure car accessories found it very easy to produce the special goods for truck use along with their regular lines. Still, nearly all of them have been obliged to increase the capacity of their works to accommodate the growing business. There are over 950 companies engaged in the manufacture of automobile and truck accessories. Their combined capital amounts to almost \$300,000,000, and the value of their total output for the year of 1911 was \$255,202,000.

During the year 1911 imports of automobiles and parts to this country fell off considerably, while American exports increased correspondingly. The imports amounted to \$2,000,000 in all, and about \$200,000 of this was invested in trucks, taxicabs, etc. Our exports of automobiles and parts totaled over \$21,000,000, and about \$2,000,000 of this represented the value of the trucks. It is a question at present whether there is much of a field for the American truck in Europe, but there is undeniably plenty of opportunity for it in South American countries and in Australia and the lands of the East. Many of the manufacturers have already realized this and have mapped out more or less definite campaigns with the idea of introducing their product into these foreign countries, while others, quicker to take advantage of their opportunities, are even now exporting a creditable number of commercial cars to these regions. They have found that, though the expense of shipping bulky commercial vehicles to distant points is very large, if a number of them are sent to the same place at the same time the cost of transportation is not so great as when only one or two trucks are shipped at a time. This, of course, tends to a large and rapid increase in the exportation of trucks, provided the American manufacturers find the market for their machines as good as they are entitled to expect. The exportation of American-

made pleasure cars has begun to grow tremendously in the last three years, particularly in 1910 and 1911, and there is no reason why there should not be a corresponding increase in the foreign sales of American commercial cars.

It is interesting to compare the number of trucks of different sizes in use. In order to secure the ratio necessary for the calculation of these figures, as well as the total output of American trucks in 1911, THE AUTOMOBILE obtained from the manufacturers their respective output of the different sizes of trucks for the year. The results of the calculation based upon these figures, is shown in the diagram on page 366, in which it is assumed that, as there were 23,855 commercial vehicles in use in 1911, there are 25,000 by this time. This assumption is fully justified at the present rate of increase in the use of trucks in this country. Referring to the diagram, the preponderance of the light delivery wagons is readily seen, as they make up 10,000 out of the total of 25,000. The smaller tradesmen are finding these very handy, as they cover distance quickly, have ample capacity for the small, light loads they are called upon to carry and do not cost nearly so much to maintain as the larger vehicles. There are a great many business men, however, who find the 1-ton truck very useful and more suited to their needs than the light delivery wagon or the heavier type of car. These number about 6,000, as may be seen in the diagram. Next comes the 2-ton truck, with 3,500 users, and then the 3-ton car with 3,000. The 3-ton is popular, and appears to mark the line of demarcation between lighter types of truck and the really big, heavy ones. When we come to the 4-ton class there is a falling off of 50 per cent. as compared with the 3-ton cars, and we find only 1,500 users. The big, heavy trucks are not very widely used on account of their great cost and the heavy expense of maintaining them. There are only 1,000 users of the 5-ton size and only about 500 people or corporations who cared to assume the expense entailed by the operation



Curve showing production of trucks since 1902

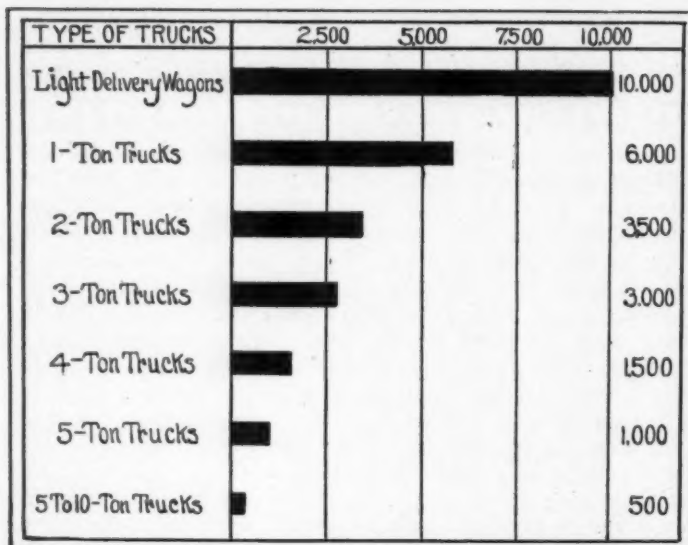


Diagram of proportion of truck types

and maintenance of a truck of greater capacity than the 5-ton size.

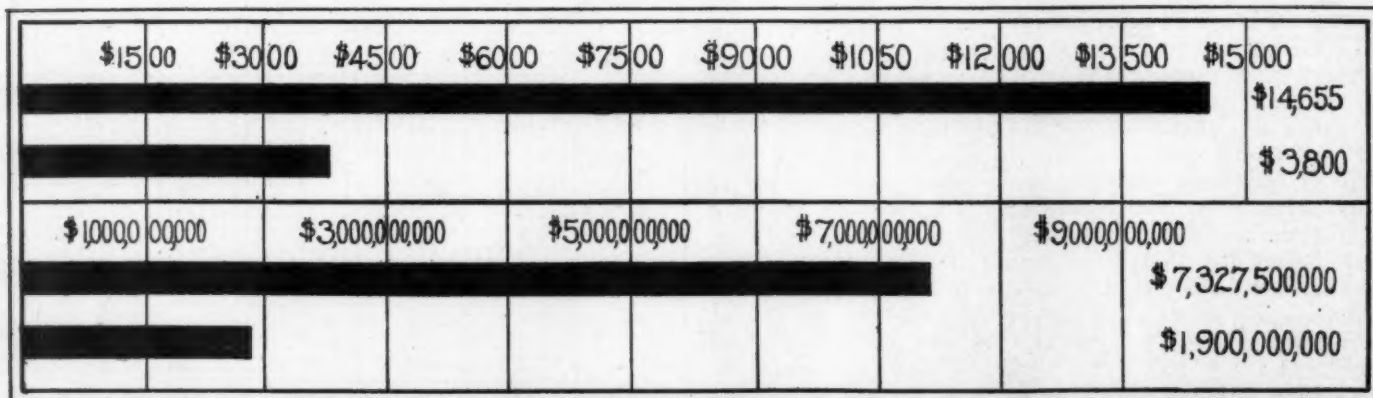
It is remarkable to how great a number and variety of uses the motor truck adapts itself. At first the only type seen was the light delivery wagon. Then larger wagons began to appear, shortly followed by the first motor-driven fire department vehicles. Now almost all the large cities and a surprising number of the smaller cities and towns are equipping their fire departments with apparatus of this sort. When it is realized that there are over 30,000 horse-drawn fire-wagons now in use, or one for each 2,500 to 3,000 inhabitants, it is clearly seen that this is a very large field for the commercial car, as there is no reason why all these horse-drawn wagons, consisting of hose-carts, hook-and-ladder wagons, fire engines, chemical carts, water-towers, etc., should not be replaced by automobile apparatus. This is especially reasonable as the greater power and capacity of the motor-driven vehicle make it not only swifter and more efficient, but also more economical to the municipality which maintains it. On account of these qualities there may be a saving in the number of wagons by combining several of the apparatuses now drawn in separate conveyances by horses into one motor-driven car. For example, the high-powered gasoline engine in a fire department vehicle of this sort has ample power to pump all the water required, thus doing away with the old-fashioned fire engine. At the same time the car could carry a hook-and-ladder attachment, a reel of hose and several other pieces of apparatus. Other advantages of the automobile type of fire-wagons are that it is more reliable than the horse-drawn type, as the latter depends upon the condition of its horses, while the engine of the car is ready to run at all times. This feature is especially noticeable when several alarms are sounded

inside of an hour. The horses, spent with dragging a wagon weighing several tons a considerable distance at a rate of 15 or 16 miles an hour, are unable to respond as quickly as efficiency demands to the second alarm, and it does not take many alarms to knock them out completely. The motor-driven car, however, is always ready, always fresh, and can cover any distance at the same speed any number of times it is called upon. The gist of the matter is that the efficiency of the automobile fire-wagon is always 100 per cent., while that of the horse-drawn apparatus is usually below that figure and always variable. Wherever the motor-driven type of fire wagon has been tried it has been found not only more efficient in its service and less costly to the municipality than the horse-drawn variety, but also far less trouble to keep in order. Some of the figures given out by the fire departments of cities employing both types of apparatus credit the automobile fire-wagons with a saving of 50 per cent. over the horse-drawn wagons, considering the economy of upkeep, the greater efficiency of service and the added capacity for load and distance.

Motor-Driven Police Patrols

Many cities are using motor-driven police patrol wagons as well as fire department vehicles. Some of these may be transformed into ambulances at a moment's notice and contain compartments for storing all sorts of appliances for first aid to the injured. Statistics of the motor patrol used by the city of Syracuse, N. Y., as given in an issue of *The Commercial Car Journal*, point out very clearly the advantages of this form of patrol over the old horse-drawn type. The motor patrol, a Franklin, effected an economy of 37 1-2 per cent. a month. It made calls 45 per cent. cheaper than the horse-drawn wagon and also made 10 1-2 per cent. more calls a month. The average cost per month of the horse-drawn patrol was \$414.34, while that of the motor patrol was only \$258.54, including the cost of repairs. The old vehicle made an average of 308 calls a month, compared with 341 for the motor patrol, and whereas the cost per call was formerly \$1.34, the motor wagon brought it down to 74 cents. The old wagon depended on the horses for the speed attained and the distance covered and consequently could not make more than 15 miles an hour on an average, and covered only about 20 miles a day. The motor patrol can make any speed desired up to 50 or 60 miles an hour and covers an average of 25 miles a day. From these figures it is easy to see that all the advantage lies on the side of the motor patrol.

The cost of operation and maintenance of the different sizes of commercial cars is a matter of great interest to the average business man. This is especially the case with men who are contemplating substituting motor-driven business vehicles for the horse-drawn type. The manufacturers are fully cognizant of this interest and a number of them have collected a great volume of cost records regarding their machines used by different trades in widely separated localities. From these they have calculated averages on the various sizes, including both actual



Upper diagram—Comparative yearly cost of five teams and of equivalent truck. Lower diagram—Yearly saving effected if trucks replaced 2,500,000 teams

running expenses and overhead cost. Drivers' wages are figured at \$16 to \$22 a week, gasoline at 12 cents a gallon, oil at 30 cents a gallon, garage at \$225 to \$300 a year, tires at \$275 for a 1-ton machine to \$1,650 for a 10-ton truck, overhauling and repairing at \$300 to \$500, depreciation at 15 per cent. and insurance at \$150 to \$240 a year. The daily average of gasoline trucks is as follows:

Light wagon, averaging 70 miles a day.....	\$ 6.10
1-ton truck, " 70 " " "	8.07
2-ton " " 70 " " "	10.60
3-ton " " 62 " " "	12.20
4-ton " " 55 " " "	13.80
5-ton " " 50 " " "	15.00
7-ton " " 45 " " "	16.45
10-ton " " 35 " " "	18.50

Horse vs. Truck—Cost Compared

According to the testimony of a number of large business houses, it costs over \$8 a day to keep a wagon and team of horses at work, including the wages of the men, the entire expense totaling \$2,950 a year. The average daily cost of operation of a motor truck, deduced from the figures already given, is \$12.59, amounting to \$3,800 a year. It is a noteworthy fact that the truck costs nothing when standing idle on Sundays and holidays except the interest on the investment and storage, while the horses must be fed as well as housed. Moreover, the average truck, costing \$12.59 a day to operate, accomplishes the work of five two-horse teams, the upkeep of which amounts to nearly \$45 a day. Compared with this the economy of the motor truck is obvious.

It is estimated that there are at present 2,500,000 teams of horses in the United States engaged in work which might be done by motor trucks. The total cost of their maintenance, at the given rate of \$8 a day, is \$20,000,000 a day, or some \$7,327,500,000 a year. The place of these 2,500,000 teams could be taken by 500,000 automobile trucks, the daily upkeep of which would be \$629,500, amounting to \$1,900,000,000 a year. A clear idea of the economy of the truck compared to horses may be gained from the accompanying diagram showing the comparative cost of upkeep of one truck and its equivalent number of teams of horses for one day and for a year.

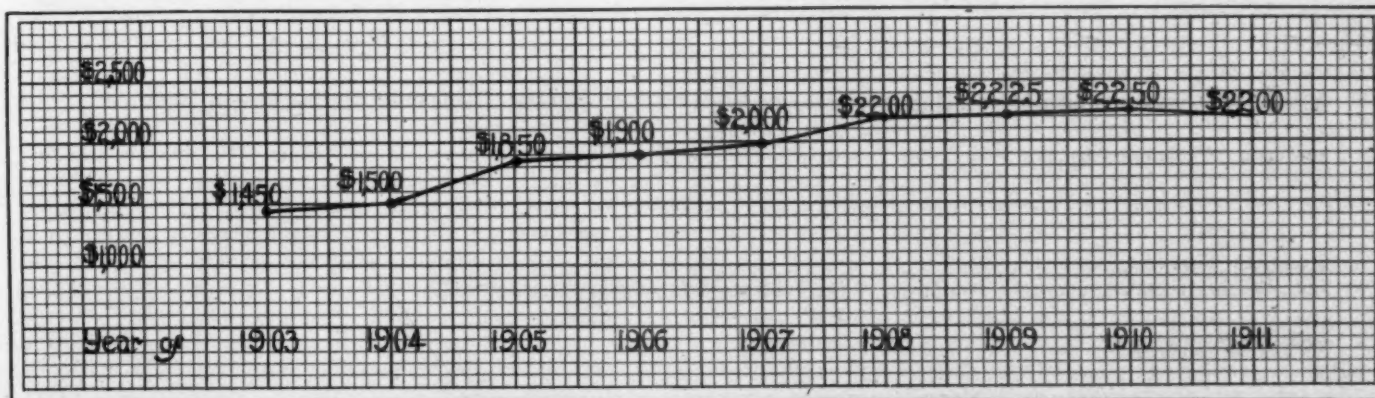
That there are 25,000 commercial cars in service in the United States today is a very conservative estimate. At the average rate of \$12.59 these trucks cost their owners all over the country \$314,750 a day, or \$94,425,000 a year. At the average rate of 50 miles a day these cars cover 1,250,000 miles a day, or fifty times the distance around the earth at the equator. The total yearly mileage comes to about 375,000,000. The gasoline used in a day by these vehicles is at least 220,000 gallons, the year's total coming to 75,000,000, which, at 15 cents a gallon, is worth \$9,000,000. The oil used amounts to 6,250 gallons a day, or 1,875,000 gallons a year, which, at 60 cents a gallon, represents the investment of \$1,125,000. Garage bills, at an average of

MANUFACTURERS OF COMMERCIAL VEHICLES AND DISTRIBUTION BY STATES

State.	Gasoline.	Electric.	Steam.	Total.
Alabama.....	1	..	..	1
California.....	2	..	..	2
Colorado.....	..	1	..	1
Connecticut.....	3	..	..	3
District of Columbia.....	..	1	..	1
Georgia.....	1	..	..	1
Illinois.....	20	..	..	20
Indiana.....	12	..	..	12
Iowa.....	3	..	..	3
Kentucky.....	1	1	..	2
Massachusetts.....	8	..	..	8
Michigan.....	38	..	1	39
Minnesota.....	8	..	..	8
Missouri.....	7	..	..	7
Nebraska.....	2	..	..	2
New Jersey.....	5	1	..	6
New York.....	28	3	1	32
North Carolina.....	1	..	..	1
Ohio.....	34	2	..	36
Pennsylvania.....	12	3	..	15
Rhode Island.....	1	..	..	1
Texas.....	2	..	..	2
Virginia.....	2	..	..	2
West Virginia.....	2	..	..	2
Wisconsin.....	14	..	..	14
	207	12	2	221

\$300 a year, mean \$750,000. Tires are very important factors in truck upkeep, but their cost and durability differ so widely, depending on the size of the truck and the conditions under which it is operated, that it is practically impossible to give figures which would even approximate the average. The personal equation entering into the driving of the truck is not to be ignored in this connection, as one driver can get much better results from a car than another man operating the same truck under identical conditions. If a truck is not driven faster than 15 miles an hour and is not overloaded the life of a set of truck tires should be close to 11,300 miles. These figures are based on records kept of tests actually made by firms operating trucks on a large scale.

An interesting feature of the growth of the automobile truck industry is that the manufacturers are finding that more and more commercial cars are being absorbed by the West for use in helping to build up the great businesses which are already beginning to rival those of the East. However, the Eastern business men are adopting the motor truck just as rapidly as those of the West, while the Eastern farmers are commencing to take kindly to it. About 10,000 firms operate the 25,000 trucks now in use, some of which maintain fleets of over 100 big cars while others have only one light delivery wagon. The number of trucks in service in the United States at the present time is perhaps more readily realized when it is considered that, if placed in a straight line and conservatively figuring the average length over all at 14 feet per car, they would extend over a distance of 66 miles. If 200 feet were placed between them they would extend over 1,070 miles, or farther than from New York to St. Louis. And, at the present rate of production, it will not be long before such a line, comprising all the commercial cars in service in this country, would reach from New York, or perhaps from Boston, to San Francisco.



Curve illustrating the fluctuation in the average price of the American commercial car from 1902 to date. There has been no marked change since 1908



General view of the accessories in the Coliseum Annex, second floor

Among the New Accessories at Chicago

Recent Improvements in Car Equipment Noted by "The Automobile" Representative in a Round of the Galleries

MANY accessories of merit, which were not shown to the public at any of the Eastern shows so far, have been introduced at the exhibition in Chicago. These articles, which tend to add to the comfort and appearance of the car, have not been hitherto described in *THE AUTOMOBILE*, but are now mentioned in connection with the Western exhibit. The following descriptions of miscellaneous accessories will serve to bring out the developments in this field and to give some idea of the numerous new articles which can now be bought by the autoist. Self-starters, motor-driven tire pumps, demountable rims as well as crankshafts, rear axles and other transmission parts are engaging prominent attention:

Automatic Motor & Engineering Company, Chicago—The Church pneumatic system, which by installing an air controller creates a variable compression motor operating upon a two-cycle principle, is exhibited by the firm. This system abolishes transmission-friction clutches and other complicated mechanical features. The controller is formed by three cylinders anchored to the flywheel, the pistons of which are operated from triple-bevel gears, the driving gear being keyed to the driving shaft. The controller is dependent upon the resistance of the load for the amount of air pumped or the compression which it creates. No mechanical drive exists between motor and controller, the medium of power transmission being that of the compression in the controller cylinder. The controller is designed for any speed. Clutch action is supplied by governing the amount of air admitted to the controller, making the transmission auto-

matic. An auxiliary air tank is automatically supplied with a fixed air pressure for purposes of starting. The same motor may be used for gasoline, kerosene or crude oil.

Barco Brass & Joint Company, Chicago—The Barco chimes give a clear, rich tone and may be made loud or soft as desired. They are made of brass with an aluminum core. The outfit is furnished complete with valve pedal and wire cable. In addition to the chimes an exhaust-horn valve has also been brought out. It is installed by cutting out a short section of the exhaust pipe in front of the muffler and slipping the device over the opening. The Barco cut-out valves are made in two parts and clamp on the outside of the exhaust pipe without cutting the pipe in two.

Dean Electric Company, Elyria, O.—In addition to the horn specialties which this company puts out, the Dynalux electric lighting and starting system is made. The generator of this system is geared or belted to the crankshaft of the motor, regulating, itself, the current which is delivered to the lamps and storage battery. The circuit is automatically opened when the engine is not running or when the speed is too low to generate electric current. At such times a 6-volt storage battery, which is a part of the outfit, furnishes the required current. The current for lighting is distributed to the head, side and tail lamp, and also into the ignition and signal service by individual carrying wires and each is controlled by a switch on the dash.

Brown Company, Syracuse, N. Y.—A full line of the specialties, which consist of a valve-grinding set, compressometer,

tire-pressure tester, combination oil and grease gun, auto creeper and spark-plug wrench, have been included in the Brown Company's exhibit.

Continental Motor Company, Muskegon, Mich.—Several sizes and types of Continental motors have been brought to Chicago for the show. The newest product of the company is a six-cylinder motor having its cylinders cast in blocks of three. This new motor is of the L-head type and the valve mechanism is inclosed. With a horsepower of 45 and a bore of 4 1-8 inches, stroke of 5 1-4 inches, the total weight is a little over 720 pounds. This engine is furnished either in a unit power plant or independent main-frame construction. It follows along the general lines of the Continental design and it has been constructed with the idea of compactness so that its installation may be effected in a moderately sized hood length. In addition to this motor the company makes a four-cylinder monobloc type, and a four-cylinder type cast in pairs.

Cotta Transmission Company, Rockford, Ill.—Transmissions and levers form the principal output of this company. The feature of this transmission is that the gears are always in mesh, a special clutch being provided for each gear. For this year, instead of the use of plain bronze bearings in their transmissions, the Cotta company is using roller bearings of standard construction. For the Sheldon and Timken companies a jackshaft outfit, which embodies the principles and mechanical features of the Cotta design, is also being manufactured.

W. H. Leland & Company, Worcester, Mass.—This concern makes a specialty of finishing automobile crankshafts. The rough forgings are either supplied by them or by the customer as desired. High-speed drills of either gang or single construction and also the universal grinders, which can be used for precision tool and grinding work, are among the company's principal manufactures.

Turner Brass Works, Sycamore, Ill.—Automobile accessories, comprising robe rails, pressure floor pumps, pipe connections, bumpers, brazing machines and blow torches, are on exhibit. The company is featuring its hot-blast portable brazing machine. This apparatus uses either gasoline or kerosene. This

machine consists of two powerful burners, each attached to 10 feet of flexible oil tubing and fitted with suitable valves and connected to a 10-gallon seamless steel tank. The tank has pump and air-gauge fittings. After the burners are lighted the machine works automatically, throwing flames which can be directed and concentrated on any desired point.

Mayo Manufacturing Company, Chicago—A spark-plug pump, which is adapted for use on all four-cycle motors, is offered. It affords a means of inflating tires by inserting the device in the hole provided for the spark-plug. The pumping piston operates only when the motor is run on low throttle and automatically locks when the engine is raced. It is furnished complete with 12 feet of hose. In addition to this article a new compound lever pump and a new tire gauge have been recently brought out.

Gray-Hawley Manufacturing Company, Detroit, Mich.—A number of accessories of this company's make are on show, the newest of which is the Autolarm, which is clamped on the exhaust pipe between engine and muffler, and operates on the exhaust from the engine. Besides several signal devices, foot pedals, muffler cut-outs, mufflers, gasoline filters, compressors and engine fittings are marketed.

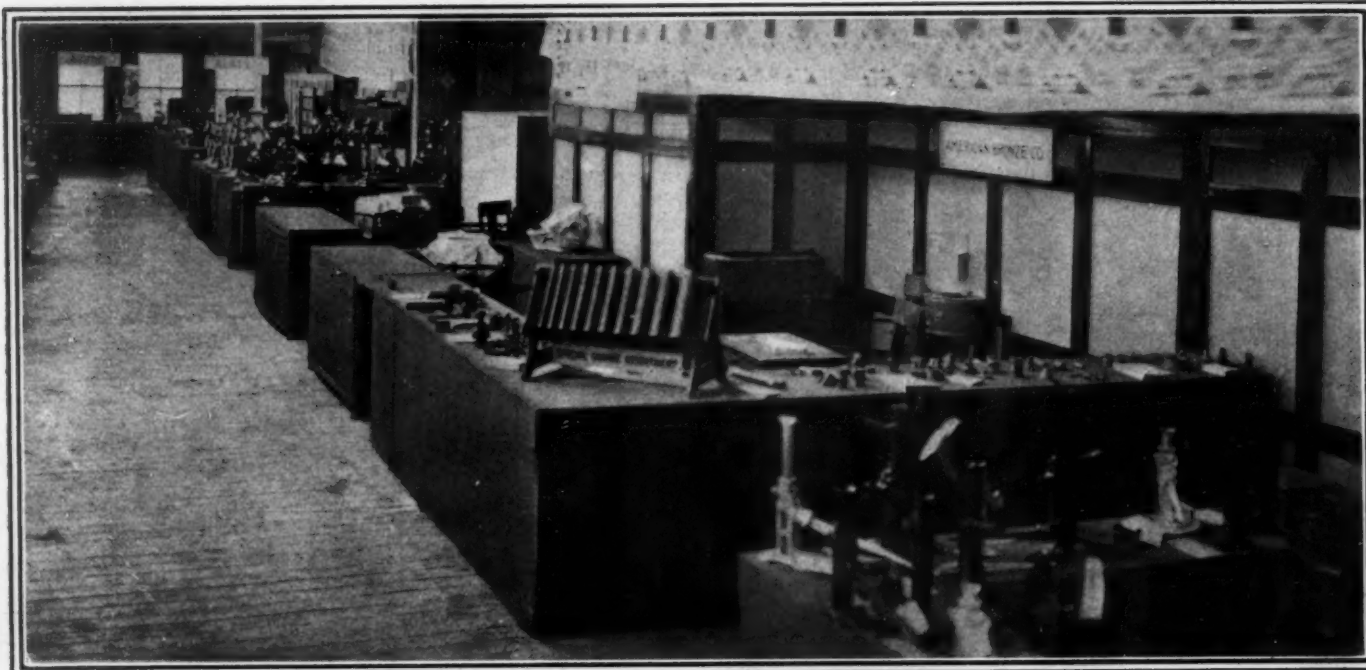
Universal Tire Protector Company, Angola, Ind.—A non-skid and puncture-proof tire protector is to be seen at this firm's exhibit. It is made of heavy leather as the main body and is reinforced over the entire wearing surface. The traction surface has embedded in it heavy studs making a very lasting construction.

Standard Varnish Works, New York—The W-S for automobile and carriage finishing is featured in this exhibit. This method is claimed to eliminate all rough finishing and to save from 7 to 10 days in the body work of a car. The system is applicable to metal as well as wood bodies.

Selbach Rubber Company, Boston—Safety sleeves, casing linings and outside protectors are manufactured. The safety sleeve is designed for insertion on the inner side of a tube to remedy a blow-out, while the casing lining covers the inside of the casing around the entire length from bead to bead.



Where the newest things in accessories were to be found—second floor of the Coliseum Annex



Long line of accessories exhibits at the south end of the Coliseum balcony

E. Edelmann & Company, Chicago—The newest device manufactured by this exhibitor is the automatic gas-tank regulator, which fits any make of tank and maintains a constant gas pressure for delivery to the lamp at all times. A full line of other auto specialties are put out, in connection with which the Economy tire gauge is one of the newest creations.

Martel Blow-out Protector Company, Chicago—A blow-out protector and special plate are the articles shown. Either of these devices is claimed to eliminate vulcanizing and also the use of an inner patch. When a blow-out occurs it is said to only be necessary to change the inner tube and to apply one of these special articles. The Martel plate is a new construction which clamps under the tire next to the rim and serves to hold an impending blow-out.

Imperial Brass Manufacturing Company, Chicago—Everything along the line of brass work for motor and body parts are to be had from this firm. Also included in the line is a full quota of brass water pipes, manifolds and pipe fittings, hub bands and caps, gasoline floats, strainers and filler cups are included. A new carbureter attachment, a new priming device for carbureters and a line of lubricators are new departures for this company.

Universal Wind Shield Company, Chicago—Rain vision and ventilating wind shields of all types and for attachment to all hood forms have been brought out. These are made in a number of models at various prices. They are finished in brass and the filler boards are well polished.

C. M. B. Wrench Company, Syracuse, N. Y.—Adjustable hand socket and ratchet wrenches for getting at any size of nut or bolt are shown. These special articles are made so as to facilitate work of inaccessible nature. Spark-plug wrenches each having sockets of two sizes are also carried.

Hayes Wheel Company, Jackson, Mich.—Hickory wheels of all sizes and types for pleasure cars as well as commercial vehicle work are manufactured by this concern. The best grade of material is incorporated.

Adam Cook's Sons, New York—Cook's automobile transmission lubricant and Albany grease are featured in this exhibit. The former maintains a minute film of oil over an unlimited surface and lubricates well all parts with which it comes in contact. Albany grease is for use especially in differentials and like parts.

Kinsey Manufacturing Company, Toledo, O.—This company makes a number of automobile parts, among which may be numbered steel frames, steel crossbars, truck frames, Kinwood cellular radiators, mufflers, hoods, oilers, and fans.

Falls Machine Company, Sheboygan Falls, Wis.—Falls motors and unit power plants are well represented. The models manufactured consist of a 40-45-horsepower model B, 30-35-horsepower model C, 35-40-horsepower model D. Unit power plants are furnished with or without foot pedals, control levers and transmission brakes, and may be had from the company for either three or four-point suspension.

Longdin-Brugger Company, Fond Du Lac, Wis.—Several styles of tops are shown, the newest of which is a specially constructed roadster top of substantial form. In connection with these specialties a lighting arrangement having concealed wiring within the top frame members provides light in the center of the top over the tonneau.

Model Gas Engine Company, Peru, Ind.—Motors of a number of types have been brought to Chicago by this concern. The newest construction is a rotary valve motor made under the Renold patent. The cylinder dimensions are 4 inches by 5 1-2 inches. This motor is installed in a unit power plant in connection with which a three-speed or four-speed transmission may be had. Another new motor has been brought out having a bore of 4 1-4 inches and 5 1-2-inch stroke. This motor is of the L-head poppet type. The same unit power plant construction in connection with which a governor for trucks has been added is in evidence. On one of their types an Eveland electric starter has been placed. This new electric equipment is of peculiar form, the armature of the generator acting as the fly-wheel.

Norton Grinding Company, Worcester, Mass.—A dozen samples of two, four and six-cylinder crankshafts for incorporation in standard makes of engines are shown. This is done to illustrate the type of workmanship which can be produced on the Norton grinding machine. Also a number of camshafts having the cams cast integrally are to be seen, as well as several Knight motor slide valve auxiliary crankshafts. These are also exhibited to show the character of the Norton machine's products. A new machine which the company is featuring is shown by drawings and illustrations and consists of a balance machine for testing crankshaft, flywheels, and clutches for running balance.



Showing one side of the Armory balcony, where the accessories are installed

Waukesha Motor Company, Waukesha, Wis.—The dimensions of the models made are as follows: 4 inches by 4 inches; 4 1-4 inches by 4 3-4 inches; 4 1-2 inches by 4 3-4 inches; 4 3-4 inches by 5 inches; 4 1-4 inches by 6 1-4 inches; and 5 inches by 6 inches. These are separate motors. In addition to these three types, namely, the 4-inch by 4-inch, 4 1-4-inch by 4 3-4-inches, and 4 1-2-inch by 4 3-4-inch types are made with unit construction. The entire line is equipped with nickel chrome steel, crankshafts, piston pins and camshafts. A self-starting model is also exhibited which has in connection with it a three-cylinder air motor geared with a ratio of eight to one to the motor driving member. A new long-stroke motor having a bore of 4 1-4 inches and a stroke of 6 3-4 inches and developing 40 horsepower at 900 revolutions per minute for motor plows and trucks is seen. All these types of motors have L-heads and inclosed valves.

Wisconsin Motor Manufacturing Company, Milwaukee, Wis.—Five motor sizes are on view in this exhibit. They are: 35-horsepower with a bore and stroke of 4 1-4 inches by 5 inches; a 45-horsepower with a bore and stroke of 4 3-4 inches by 5 1-2 inches; 28-horsepower, bore and stroke of 3 3-4 by 5 inches; and the 60-horsepower with a bore and stroke of 5 1-4 inches by 7 inches. These are four-cylinder motors all having the T-head construction except the 28-horsepower which is of the L-head type. This latter motor is also of monobloc construction, the others having their cylinders cast in pairs. A single six-cylinder type of 50-horsepower with a bore and stroke of 4 1-4 inches by 5 inches and with T-heads is also exhibited. The new 60-horsepower has its valve springs inclosed by easily removable covers.

Ross Gear & Tool Company, Lafayette, Ind.—Steering gears and differentials for commercial vehicles are the principal output of this company. A number of changes in the steering gears have been made for 1912, the principal difference being in the change from the malleable wheels to wheels made from pressed steel stamping. Imported German balls are used in all the ball bearings in these devices. The principal feature in connection with the differential construction is in the web-shape of the housing. The differential gears are all bushed with bronze and are backed by hard fiber washers.

C. A. Shaler Company, Waupun, Wis.—A number of types of vulcanizers for all classes of work are shown, the latest addition being the portable steam vulcanizer. This device has a

thermostat, temperature control and a safety valve to insure the safety of the operator. In this machine the vulcanizing surface measures 3 inches by 5 inches, which is ample for the majority of tire repairs.

McCord Manufacturing Company, Detroit—Cellular radiators and McKim gaskets and fans make up the principal factors in this company's output. Its radiators are specially designed for truck service. They present a very substantial appearance.

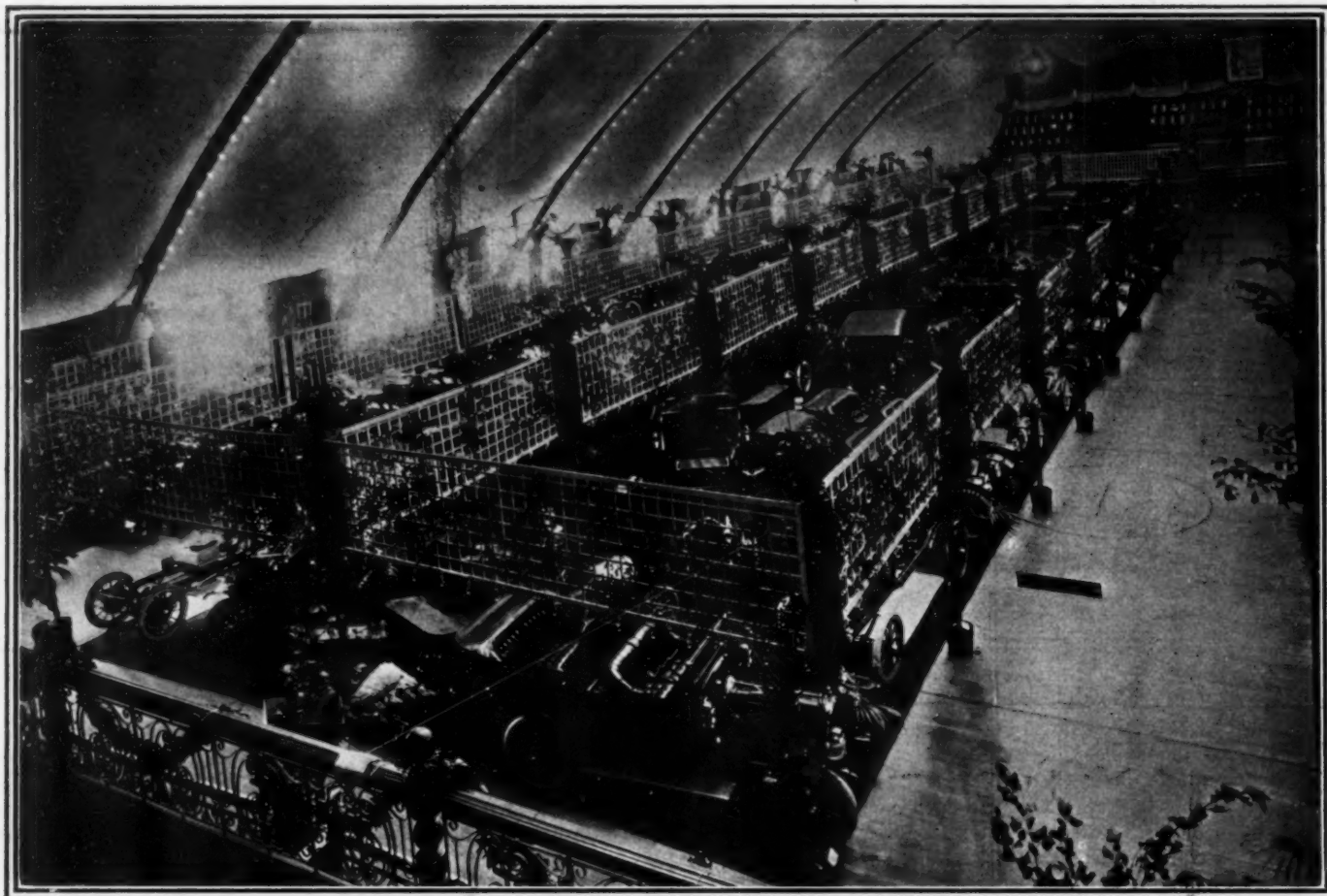
U. S. Ball Bearing Manufacturing Company, Oak Park, Ill.—All types of ball bearings are manufactured. The separators are of peculiar construction, they being flat steel disks having holes cut in them in which the balls are placed. Magneto and generator bearings have been recently designed. The separator for exclusive use of this type of bearing has been developed. Double-row bearings are also manufactured to conform with the latest engineering dictates. These bearings are constructed with steel separators which follow the same general construction.

Two Red Disks Mean; "Stop Thief!"

Intended to check joy-riding is a device upon which a patent has been applied for by William J. White, assistant manager of the Mathews Detective Agency. The device consists of a copper plate which may be fastened to any prominent part of the car where it will be visible. On the plate is a hinged metal disk, the hinge being bolted to the middle of the plate in a substantial manner.

When the owner or his authorized agent is in charge of the car, the disk is turned down and locked in place with a staple and spring padlock. When in this position the disk shows a black enameled circle.

When the owner is through with the car and wishes to have nobody use it, he unlocks the padlock; turns up the disk until it lies flatly against the plate and locks it again through another staple at the top of the plate. In this position the plate shows two bright red disks. The plan is to notify the police or others who are engaged in preserving the peace that there is always something wrong when a car appears on the street with two red disks showing, but that the presumption is favorable if a single black circle shows on the plate.



General View of Show of Rhode Island Licensed Automobile Dealers' Association at Providence

Business Boomed at Providence Show

Many Sales Put Through, Medium-Price Cars Leading

Deep Interest in the Commercial Car Apparent

PROVIDENCE, R. I., Jan. 27—Far and away in advance of anything in the automobile show line ever held in this state was the exhibition that closed tonight at the State Armory. For several years past there have been no shows at Providence and all the enthusiasm for such functions that was stored up during the barren period burst forth and blossomed at this show.

A most representative line of fifty-two makes of pleasure cars, including one electric and one steam automobile; fourteen varieties of commercials and twenty-two large exhibits of accessories, were on show.

The armory was decorated with aerial lattice twined with greenery and flowers and made a wonderfully good appearance. The pleasure cars were all shown on the main drill-floor, while the trucks and accessories were shown in the basement.

It was with considerable trepidation that the show project was taken up by the R. I. L. A. D. A. for this season and a number of active concerns in Providence imagined that they could hold back in the matter of space allotments, coming in at the last moment. Several of these companies managed to get some kind of representation, but several others failed to do so. Every available inch of space was taken, and if there had been

Local Conditions Favorable to Gasoline Trucks

50 per cent. more space it would have proved about sufficient to accommodate all the applicants.

There was a good crowd present on opening night, January 22; a bigger assembly on Tuesday and absolute capacity crowds on Wednesday and Thursday nights. Friday was another great day, with a small degree less attendance than the preceding days, and on Saturday there was a stream of visitors on business bent.

As an indication of the serious way in which Providence took her automobile show this year an incident that happened on a street car Saturday is illuminating. The representative of THE AUTOMOBILE stepped on the car and found it well filled with prospective patrons of the automobile show. When the car commenced its run to the armory the standing passengers numbered twenty-one. These divided themselves into four groups and from Union Station to the armory they discussed the relative merits of standard automobiles from the viewpoint of the buyer and user. They talked of the medium-priced lines, such as Cadillacs, Whites, Maxwells, Buicks and Chalmers, and talked as if they were going to buy cars on Saturday afternoon.

This conversation proved to be the keynote of the business done during the week. The high-priced lines sold a few cars.

The Packard, Pope-Hartford, Stoddard-Dayton, Stearns and Premier reported a few sales, ranging from a single car in the case of the Stoddard-Dayton, where it was said that one Knight car had been sold, to the Premier and Packard, which reported four cars each. In addition to the Knight car, the Stoddard-Dayton agency reported quite a lively trade in the lower priced models.

The Alco was shown for the first time in its home city and was surrounded with prospective customers throughout the week. From all indications the estimate made by the local representative of the factory that he would sell fifteen cars during the season was not regarded as unreasonable.

The Stevens Duryea, Peerless, Fiat, Pierce-Arrow, Knox, Thomas, Columbia, Winton, Locomobile and Garford all reported scattering sales and an immense amount of inquiry.

In the high medium-priced lines the Haynes, Marmon, Mitchell, Inter-State, Kissel Kar, Lexington, American, Corbin, Palmer-Singer, Speedwell and Franklin sold from one to seven cars each.

But the bulk of the business was done by the medium-priced concerns, the Cadillac enjoying a big trade; Maxwell numerous sales and lively inquiry, Buick, Oakland, Chalmers, Hudson, Marion and Abbott Detroit all being busily engaged.

As usual, the little fellows did the most business from a numerical standpoint. The new R. C. H. agency reported twenty-four sales, while the Overland, Reo, Hupmobile, Brush and Metz were rushed from Monday to Saturday. These six companies reported 119 sales. The total amount of business reported among the pleasure car exhibitors was estimated at 200, with amount of sales footing up to \$250,000.

This, however, is only a shadow of the real business that is expected from the show. With the utmost confidence it may be said that every concern that showed, without exception, received enough inquiries to keep its salesmen busy for several months. Some of the agencies have 100 or more live prospects on their card index systems as a result of the show. Even those companies that did not actually close up for a single sale have a book full of live leads to investigate this spring.

On the general average each exhibitor in the pleasure car division made two sales at an average of \$1,250 each and took the names of at least twenty-five good prospects.

The Lenox was the only pleasure automobile on exhibit that was not shown in the New York displays. It is a New England-made car of high grade and small production. It is a four-cylinder, four-cycle motor 41-8 by 51-2 inches, developing 35 horsepower. The wheelbase is 116 inches.

In the commercial section fourteen makes of business wagons were shown. The Packard, Alco, Gramm, Pierce-Arrow, Knox, White, Morgan, Pope all did some business. The International, Reo and Autocar made some sales. The Chase agency contracted to sell several of its wagons for suburban service and the Kissel Kar agency reported a mass of inquiry. The newcomer in the truck field was the Teel-Woodworth, which exhibited a businesslike 3-ton wagon that has not been shown heretofore. The company announces that seven of these cars have been in service for several months and that two of them have been working for two years.

The commercial car situation in Rhode Island is somewhat similar to that which obtains elsewhere in New England. So far the truck has not made so much progress in actual service in New England as it has in other territory. At this show a tendency of materially different tenor is apparent. The business men have been more deeply interested in trucks than they were in the standard pleasure cars.

Throughout the show the customer with notebook in hand and senses alert has been a feature. Operative costs was the subject of most insistent inquiry, while maintenance, system and service were almost equally discussed. At a bound the public seemed to accept the basic fact that any good truck will run. This naturally is predicated upon the conviction that the business men have concluded that trucks are necessary in their business.

Unless the repeated and emphasized signs fail, Providence is going to do a lot of business this season, using automobile trucks as the medium. The big freight wagons have been accepted fairly well during the past two years in this section, but the utility of the delivery wagon has been neglected as a vital factor in retail business. Curious as it may seem, the displays of commercial cars only included a few well-known makes of pure and simple delivery cars. The Autocar, International and Reo had the field mostly to themselves and their salesmen were on the keen jump all the time.

There are a number of large retail establishments in Providence that are ripe for automobile delivery service or for replacements of old equipment. Representatives of these concerns took a thorough course in the art of transportation during show week and there are certain to be some material developments within the next few months.

Local conditions are peculiarly favorable for the sale of good gasoline trucks. Much local business is done with Newport, requiring a long, straight haul, for which the gasoline truck is well fitted. Towns and cities of considerable size are ranged along almost continuously on both sides of Providence. The general business of such towns and cities really belongs to the capital city and the truck is a necessary element in the situation.

These facts are all conceded by the business men of Providence and, having demonstrated their truth, the next move is to equip their establishments with power wagons.

The earnest study of the cars on display on the part of the local business men was the most conclusive proof of the tendency of the times.

The accessory exhibit was about on a par with the average local show. Manufacturers were entirely absent and the lines of parts and sundries were shown by supply houses. There were five of these handling general accessories; two lubricants, two insurance, three motorcycles and the rest various kinds of parts and sundries and the trade press.

Viewed from every angle, the show was the most successful ever held in Providence. The amount of truck sales was impossible to determine with any accuracy. Those reported only total sixteen, but that number does not include more than four delivery wagons. As the attention of the patrons was largely centered on this type, that number does not represent the true situation.

In the accessory show there was a lively business of uncertain volume.

The show was handled very skillfully by the Rhode Island Licensed Automobile Dealers' Association, under the management of Arthur S. Lee, agent for the Corbin line, as show manager. Charles F. Thatcher is president of the association; Mr. Lee, vice-president, and Howard L. Rice is secretary-treasurer. The board of directors includes, besides those three, the following: Frank J. McCaw, William Hughes, A. S. Hitchcock, William H. Fuller, Charles H. Goodwin and Walter P. Pierce.

The building used for the show is the new State Armory, a remarkably beautiful building, which seemed to be plenty large enough until just before show time, when the belated rush for space proved its inadequacy.

The impression on the trade was wholly pleasant, and it is safe to predict that there will be another show in Providence next winter.

Evansville Show a Success

EVANSVILLE, IND., Jan. 29—The first motor car show in this city was held under the auspices of the Evansville Automobile Club during the week of January 22 and was so successful it will be made an annual event. There were displays of forty makes of cars, the exhibits being by the fifteen dealers of Evansville and by district and state agents. There was a large delegation at the show from Indianapolis factories and distributing agencies.

Detroit Show Proves a Great Stimulus to Automobile Trade

Cars Selling Under \$2000 Meet With Special Favor

Affair Best in Local History from All Angles—Retail Orders Larger than Ever Before

DETROIT, MICH., Jan. 29.—Expectations were more than fulfilled by the Detroit dealers' show, which closed Saturday night with a great tooting of horns and other evidences of rejoicing. Half an hour later many of the show cars were being hustled out and into special trains bound for the Chicago show, and a number will make the rounds of the Western shows.

The Detroit exhibition was an unqualified success from every standpoint, making allowances for the cramped space, which forced a curtailment of some of the exhibits. The attendance was 15,000 ahead of last year, just about double, in fact. Actual results in the way of sales are a little harder to figure, but a conservative estimate is that in actual business transacted this show was from 15 to 20 per cent. ahead of last year's. There were more retail sales than ever before, more wholesale sales, more agencies placed and more good, live prospects booked than in any previous year. The Chalmers Motor Car Co., for instance, showing its full line, took the names of over 300 persons, including a large number from New York, the West and from Canada, who announced themselves as being in the market for a car. Out of these 300 names the company figures on getting twenty-five or possibly thirty sales. There were six actual sales of Chalmers cars at the show, including two of the new six-cylinder, 48-horsepower, seven-passenger touring cars. The popular model, however, was the five-passenger 36, selling for \$1,900 equipped. The Buick Motor Car Co. had a number of salesmen on hand and they sold upward of fifteen cars. The sales of high-priced pleasure cars were few.

J. P. Schneider, local agent for the Stevens-Duryea, is practically sure of four sales and has received deposits on one or two cars; the others are about convinced.

The luxurious Lozier Knickerbocker was a constant center of attraction society night.

The Winton Motor Car Co. made three retail sales, including two of the standard touring cars at \$3,500 and one Berlin. Joseph Schulte, manager of the Detroit branch of the Cadillac Motor Car Co., reports eleven individual sales.

The Neuman-Lane Co., handling the Stoddard-Dayton, the Pierce-Arrow and the Rauch & Lang electric, closed three deals and secured a fine list of prospects. The Warren Motor Car Co. claims to have sold close to a dozen cars, the standard 30's being the most popular with Warren customers.

"From a local standpoint this has been the biggest show in our history," said H. E. Yale, of the Cunningham Auto Co., agent for the E-M-F 30 and the Flanders 20. "We have secured no less than forty live prospects in addition to closing several deals."

"This show has convinced me beyond all doubt that the six-cylinder car has come to stay," said George Grant, of the Grant Bros. Auto Co., whose exhibit of Everitt "Sixes" was always thronged. "We have had a nice wholesale business all week and have made two or three retail sales."

J. H. Brady, handling the Hudson, took orders for fully a half dozen cars.

"We had a nice state business and made probably six local sales," said Robert K. Davis, of the United Motor Detroit Co.

The big demand seemed to be for the cars selling under \$2,000. Zach C. Barber, of the Barber Motor Sales Co., which has the agency for Michigan for the Detroit, reports that his concern has closed contracts for its entire allotment for 1912, and the company's output of 1,500 cars has been sold in advance, although deliveries will not begin until March 1.

The Belmobile, just brought out by the newly organized Bell Motor Car Co., of Detroit, also attracted more than passing attention in spite of the fact that it was necessary to display it outside the pavilion.

The Ford Motor Co.'s salesmen were kept busy all week answering queries and giving impromptu lectures on the Ford engine, a working model of which was shown in operation. The company also did a good business at the show, selling eight cars. In addition the salesmen secured fifty or sixty live prospects.

George Franklin, of the Regal Motor Sales Co., reports having sold twenty cars.

The Cartercar Co. reports an even dozen sales at \$1,600, and the Lion Motor Sales Co. sold ten cars at the same price.

In spite of an unfavorable location, the Hupp Corporation's new R. C. H. gasoline cars and the Hupp-Yates electric received much attention. George Hupp is authority for the statement that the company has closed contracts, as a result of the show, for 200 gasoline cars and ten electrics in Michigan territory. The Hupmobile reports a good state business. M. A. Young, handling the Elmore, Reo and Waverly, made six individual sales. The visitors displayed a good deal of interest in the Olds "Farewell Car," "Reo, the Fifth."

The Willys-Overland Co. had a factory representative on the ground and closed some good business with the Michigan dealers. He claims to have received 161 orders for immediate shipment. The Jackson Automobile Co. exhibited actual orders and cash deposits accompanying them as evidence that they had been doing business. The company made eleven retail sales during the week and placed a number of agencies in Michigan and other states. The Michigan Buggy Co., of Kalamazoo, closed agency contracts covering Florida, Tennessee, a part of Texas, Washington, Colorado, Oregon, several counties in lower Michigan and four Canadian agencies.

More interest was shown in commercial cars than at any previous show here.

A good line of electric pleasure cars was displayed.

The Miller Car Co., a comparatively new concern, with a plant at 1636 Russell street, displayed a moderate-priced touring car. It has a wheelbase of 116 inches. The motor is full 30 horsepower with a 5-inch stroke and a 3 3/4-inch bore.

The Detroit Automobile Dealers' Association is several thousand dollars to the good on account of the show. It was easily the most successful in Detroit's history.

Fine Decorations at Syracuse Show

SYRACUSE, N. Y., Jan. 27.—Manager W. R. Marshall, of the Syracuse automobile show, announces that the decorations and lighting effects will be more elaborate than anything heretofore attempted here. Just inside the entrance to the main hall will be erected a large concrete fountain with massive ornamental pillars and illuminated with electric lights. The ceiling will be paneled in a delicate sky-blue with hand-painted centers, and around the edge of the balcony will be a lattice work covered with Southern smilax and carnations and intertwined with electric lights, the balustrade and steel structural work being completely hidden. A series of latticework arches will run around the ceiling directly over the edge of the balcony and in the center of each arch will be a birch bark cage containing a singing canary.

On the exterior of the tower there will be an illuminated automobile 12 feet high and 16 feet long, bearing the words "Auto Show."

Philadelphia's Two Weeks' Show Results in Sales of \$1,000,000

The Two Armories Crowded With Buyers During the Fortnight

Weather Helps the Commercial Contingent—Autocar Burglar-Proof Bank Car Stars

PHILADELPHIA, Jan. 28—When the doors of the First and Third Regiment Armories were closed last night, the most successful automobile exhibition ever held in Philadelphia, both in the amount of business transacted and in attendance, was brought to a conclusion. While no exact figures are obtainable, J. H. Beck, secretary of the Philadelphia Automobile Trade Association, under whose auspices the eleventh annual exposition was conducted, places the count at 35,000, divided 25,000 the first week and 10,000 the second, which figures show a gain over last year of 20 per cent.

Especially gratifying to those conducting the show was the interest shown during the last week, when, owing to the nature of the exhibits, it was not anticipated that the general public would so readily respond, interest in the commercial vehicle usually being confined to business men.

Business from the exhibitors' standpoint has more than confirmed expectations throughout the two weeks. A conservative estimate of \$1,500,000 has been placed on the value of the machines sold and allowing for only a small percentage of prospects. An undercurrent of doubt existing previous to the holding of the exhibition as to its success, some believing that interest in midwinter shows was on the wane, has been thoroughly dispelled, and the stimulus to the industry received from the one just ended promises to make the year 1912 a record-breaker.

By dint of a great deal of hustling every vestige of the gasoline pleasure car exhibit was removed last Sunday and by the opening of the second half of the show on Monday morning the new electric signs for the commercial vehicles and the electric pleasure car exhibits had been placed and the interior of the two buildings transformed, although all the cars were not here for installation. But by Tuesday the exhibition settled down to a businesslike basis and the adaptability of the commercial vehicle to almost every transportation demand was forcibly demonstrated.

The exhibition at the First Regiment Armory was divided between electric pleasure cars and motor trucks, while the Third Regiment Armory display was devoted to motor-propelled vehicles exclusively, along with a hold-over accessories exhibit. The electric pleasure cars, although in the minority, demonstrated that in gaining adherents they have kept on the top of the heap, too, their many advantages for town and suburban use being fully appreciated. Quietness, simplicity of operation and cleanliness are arguments hard to beat and their appearance on the streets is noted with greater frequency than ever before.

The exhibit of commercial cars was the most comprehensive ever held here. As their accomplishments become more generally known the more is their business-building power driven home, and their daily performances are their best salesmen.

During the past week opportunities were presented to forcibly demonstrate the superiority of the motor truck. On Friday a 6-inch snowfall and its attendant difficulties to horse-drawn equipment proved the value of motor transportation. A thaw had preceded the storm and when freezing weather accompanied the latter the footing was extremely treacherous. On streets like Broad and Diamond, which have a smooth surface for miles, the sight of a fallen horse became so common as not to attract

more than passing notice. Trolley cars held up by fallen animals, whose drivers sought the protection the rails offered, were a common occurrence.

In the meantime fleets of motor trucks wended their way east and west, north and south with no more effort apparently than under normal conditions. Perhaps there is some significance attached to the fact that Friday evening recorded the high-water mark for attendance.

In order to facilitate the transportation of visitors between the armories the management of the show installed a free motor bus service on Wednesday.

The bus, which was a mammoth Saurer provided by the International Motor Company, 635 North Broad street, had a seating capacity of twenty-nine passengers and ran on a regular schedule. Capacity loads were carried on almost every trip. The truck was heated and successfully showed its adaptability for travel on streets where there are no trolley lines.

Quite the newest motor-driven car to make its appearance is the Autocar armored steel burglar-proof bank car, the property of the First Mortgage Guarantee & Trust Company, of Philadelphia. While the car has seen several weeks' service for this company, its use this week attracted more attention by reason of its being used to transport the receipts of the automobile show from the armories to the bank.

The car is very massive, being constructed mainly of steel armor, containing a steel safe deposit vault and patented electric burglar alarms, in addition to which it is bullet-proof. In the service of the bank it is used to carry payrolls to factories and mills and to transport large sums of money and bullion.

The car is divided into two compartments, the front for the driver and a passenger, the banking room being in the rear. Electric lighting forms part of the equipment and communication between the two compartments is established by a series of signal devices.

Another device is an arrangement whereby the banking van can be locked and left standing. Should outside interference be attempted electric alarms would immediately be set off, arousing the neighborhood.

Many of the local exhibits are booked for the Chicago show and were immediately shipped upon conclusion of the local exposition.

Tent Show for Indianapolis

INDIANAPOLIS, IND., Jan. 29—A motor car show will be held in this city under the auspices of the Indianapolis Automobile Trade Association, March 25 to 30. The show will be held in a tent surrounding three sides of University Park and a part of the net proceeds will be contributed to a fund to be used for the erection of a coliseum. There is no building in the city large enough for a motor show under one roof, hence the present plan for a tent show.

Mayor Shank, the board of public works and the board of public safety have given permission to erect the tent in Meridian, New York and Vermont streets, around three sides of University Park, close to the heart of the city. The tent will be C-shaped and if stretched out would be three squares long, giving more floor space than may be had in the Chicago coliseum. The tent will be elaborately decorated and illuminated with electric lights. It will be waterproof and inclement weather will not interfere with the exhibition.

Every manufacturer in Indiana and every dealer in Indianapolis will be invited to exhibit and it is expected that something like eighty makes of cars, together with accessories, tires, etc., will be shown.

The need of a coliseum in this city has long been felt and the motor car interests are anxious that some definite step be taken toward providing one. Commercial and civic organizations have already taken up the matter and have decided to appoint committees to devise means of financing a coliseum project.

Pittsburgh Show Opens

Thirty-six Cars and Many Accessories Concerns Represented

Next Week's Truck Exhibit to be Largest in Pennsylvania

PITTSBURGH, PA., Jan. 29—The sixth annual show of the Automobile Dealers' Association of Pittsburgh opened in Duquesne Garden Saturday evening with a brilliant display. The show committee is composed of R. P. McCurdy, chairman; F. D. Saupp, A. X. Phelan, George P. Moore, Thomas F. Dunn and W. N. Murray.

The ceiling had been covered with thousands of feet of lattice and trellis work in which were interwoven brightly colored vines. The same lattice work effect was seen on the side pillars and around the balcony and set forth to splendid advantage the colors of the show—red and white.

The motor truck exhibit which will be put on next week will be, according to present indications, by far the largest and most important display of commercial vehicles ever seen in Pennsylvania. Bookings are already far ahead of last year's show, and arrivals of trucks from distant points are being promised by telegraph every day so that the optimistic prophesies made will prove to be well justified.

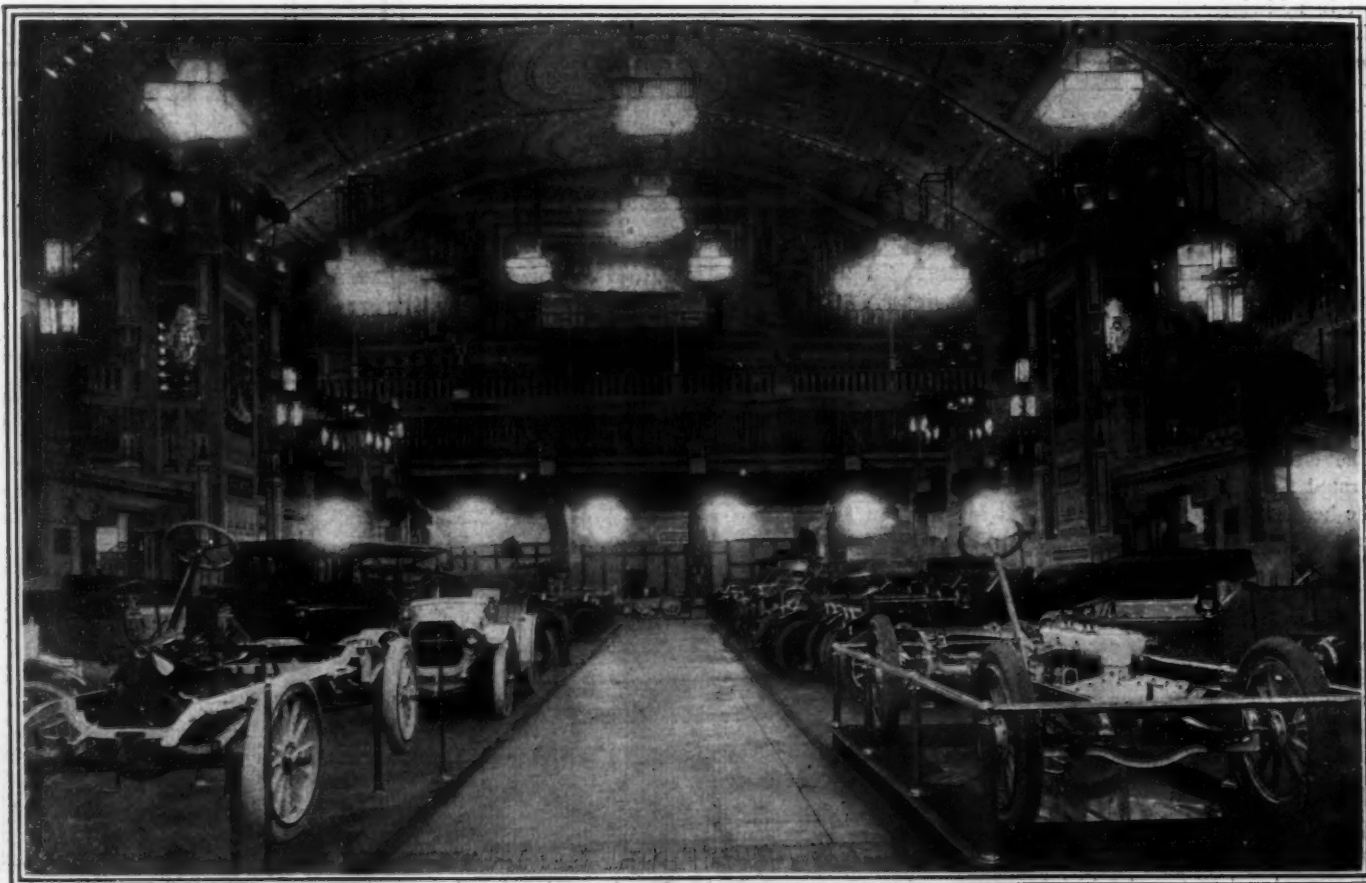
The complete list of automobile exhibitors at the Duquesne Garden Show this week, including the automobile and accessory departments, is given herewith:

Abbott-Detroit Motor Car Company, Abbott-Detroit.
Eddie Bald Motor Car Company, Everitt.
Baker Electric Sales Agency, Baker-Electric.
W. W. Bennett Motor Car Company, Pope-Hartford.

Buick Motor Company, Buick.
East End Auto Company, Waverley.
Ford Motor Company, Ford.
Franklin Auto Company, Franklin.
J. E. Graham Company, Reo-Kissel.
Hiland Automobile Company, Peerless.
Keystone Automobile Company, Stoddard-Dayton.
McAllister Bros. Motor Car Company, Cadillac.
McCurday-May Company, Pierce Arrow.
N. C. Morrison Company, Pilot.
A. X. Phelan, Lozier.
J. M. Quimby Company, Simplex.
Pioneer Motor Car Company, Pioneer, Hudson.
Pittsburgh Chalmers Company, Mitchell-Mercer.
Pittsburgh Mercer Company, Mitchell-Mercer.
Poffinberger Motor Car Company, Marmon.
Premier Motor Company, Premier.
Robinson Painter Company, Garford-Overland.
F. B. Stearns Company, Stearns.
Standard Automobile Company, Packard.
United Motor Pittsburgh Company, Sampson-Mexwell-Columbia.
Vestal Motor Car Company, Stevens-Duryea.
The White Company, White.
Winton Motor Car Company, Winton.
R. & L. Electric Sales Company, R. & L.
Schacht Motor Car Company, Schacht.

The accessories exhibitors include:

Atlantic Refining Company, oils, greases, lubricants, etc.
Auto Tire Company, tires.
Automobile, automobile journal.
Automobile Journal, automobile journal.
Bell Telephone, telephone service.
Parker Wind Shield Company, wind shields.
W. G. Bratton, speedometer.
Chamberlain Manufacturing Company, desolve metal polish.
Class Journal Company, automobile journal publishers.
Eyler & Henry, auto insurance.
E. J. Flentje, shock absorbers.
Hipwell Manufacturing Company, automobile horns.
Hoover & Hurst, automobile insurance.
Iron City Spring Company, automobile springs.
Jackson Motor Supply Company, automobile accessories.
A. E. Kent Company, automobile insurance.
Mutual Windshield Company, windshields.
Motor Age, automobile journal.
McGraw Tire & Rubber Company, tires.
Penn Automobile Specialties Company, automobile accessories.
Pittsburgh Lamp & Repair Company, radiators, lamps, etc.
Pittsburg Automobile, Equipment Company, automobile accessories.
Pyrene Sales Company, fire extinguishers.
Standard Automobile Company, auto accessories.
Seeroad Lamp Swivel Company, Seeroad lamps.
Universal Appliance Company, automobile mirrors.
Wayne Oil Tank and Pump Company, oil tanks and pumps.
Winterton Manufacturing Company, windshields.
Joseph Woodwell Company, automobile accessories.
Union Specialties Company, windshields.



Arrangement of the Coliseum exhibits in Chicago should prove valuable to local show promoters

Rubber from Nipped Cotton Bolls

AUSTIN, TEX., Jan. 29—The manufacture of rubber from unopen cotton bolls may become a real industry in Texas and the other Southern states. It is claimed by W. P. Wilson, director of the Commercial Museum, Philadelphia, that a process has been discovered for extracting a substitute for vulcanized rubber from the green cotton bolls and that the cost of manufacturing the product is considerably less than that of ordinary rubber.

In a recent letter to Governor O. B. Colquitt on the subject Mr. Wilson says that the utilization of the unopen bolls in the manner proposed will give them a value of 3 to 4 cents per pound, whereas they are now worthless. It is estimated that about 15 per cent. of the bolls of the cotton plants get caught each year by cold weather and do not open; in other words they do not produce any staple.

It has long been known that these unripe bolls contain a sticky substance, akin to rubber, but until the discovery of the process noted by Mr. Wilson for extracting and congealing this ingredient was made it was generally supposed that it had no commercial value. If the farmers are able to obtain 3 or 4 cents per pound for their unopen cotton bolls it will bring to them much money from that crop each year.

Automobile New Year's in New York

Automobile registrations for 1911 ran out yesterday in New York, and the new licenses went into effect today. The plates have been ready for delivery for over a month and consequently there was no overpowering rush for them as the 1911 season closed.

In New Jersey the new automobile year commenced today and the new navy blue and yellow plates were given out by the hundreds.

News of Other Shows

Cleveland, Baltimore, Atlanta and Other Cities in Line

Smaller Cities in Throes of Preparation for Similar Exhibitions

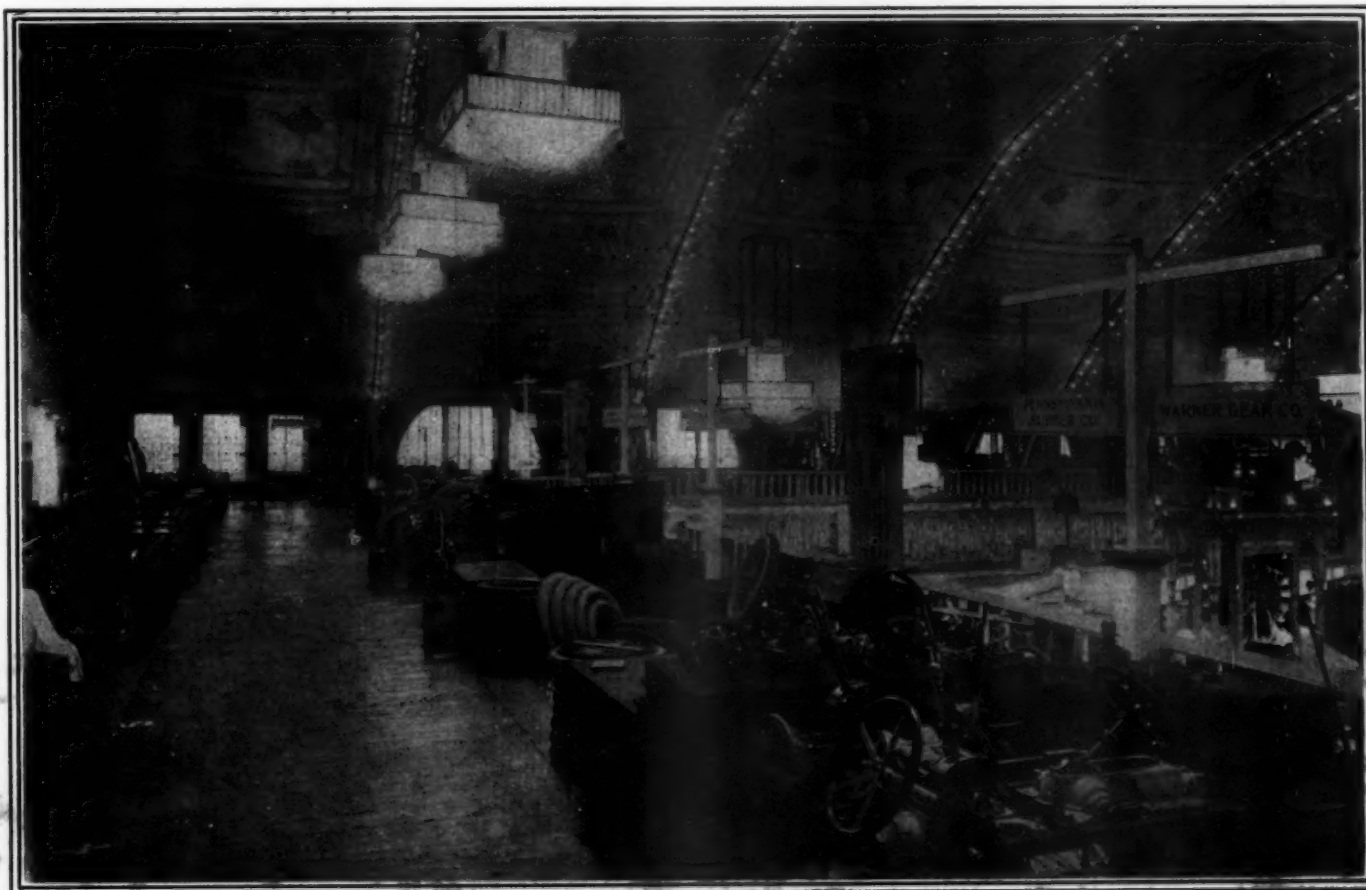
CLEVELAND, O., Jan. 28—Every foot of space has been taken for the Cleveland automobile show and the board has been approached by so many dealers who are anxious to secure reservations that the board is making efforts to provide extra space in some way. The committee has taken care to provide all details conducive to the comfort and enjoyment of visitors and exhibitors.

BALTIMORE, MD., Jan. 29—Space allotments for the pleasure cars and accessories companies to have exhibits at the local motor car show, February 20 to 28, in the Fifth Regiment Armory show that the thirty-five concerns will participate and that over fifty cars will be seen on the floor of the armory. In addition there will be about a score of accessory exhibitors.

ATLANTA, GA., Jan. 29—The Atlanta Automobile and Accessory Dealers' Association will take over the Atlanta Auditorium-Armory on Feb. 1 and begin the work of decoration for the show which begins Feb. 10.

LIMA, O., Jan. 29—The Lima Automobile Dealers and Garage Proprietors' Association, held a meeting recently and decided upon February 5 to 8 inclusive, as the dates for the Lima show.

READING, PA., Jan. 27—This city is to have an automobile show and the date has been fixed from March 4 to 9. It will be held under the auspices of the American Exposition Company, with A. A. Fink, of Reading, as director. The show will be held in the old Reading Railway shops.



Despite the demand for space the accessories in the Coliseum gallery were amply provided for

Electric Cars Prominent at Chicago Show

Review of the Improvements a Year Has Brought Forth

THE year 1911 was a most progressive year for the electric pleasure car; it might be more proper to say that last year was a busy one in that the progress seen in the 1912 electrics was made during the months of 1911. The electric field has made phenomenal strides, both numerically and from the point of view of design.

Viewed numerically there are now twenty-one different makes of prominent electrics and there are many other makes of purely local repute. During the last year at least six names that are coming into prominence have been added. This is headed by the new Flanders, which is already well known. In the list are such other new names as Standard, Argo, Grinnell, Century and Colonial. This influx of new blood is alone sufficient proof that the electric has gained amazingly. It is only when the field is analyzed and the cars inspected that you become cognizant of what has really been done.

The progress is not all measured by the number of new concerns in the field; the old ones have been very busy. They have all been sitting up at night and figuring out the proper increase in wheelbase to accommodate the extra body types that they were bringing out. In some cases they have been

developing shaft-driven models to take the places of the older chain-driven types; and in not a few instances brakes have been made larger, using dropped side members on the frame so as to make the body lower. All this has occupied the attention of the sales and engineering forces.

Then, too, developing a fool-proof control has worried a few. There is scarcely a maker but who will talk with more or less pride on what he has done on his new models to improve the control. For example Woods will point to the new single pedal idea and couple with it the fact that one little pedal in the floor makes entrance and exit more easy for my lady driver and her passengers. Half a dozen others tell how it is impossible to accidentally throw in the reverse without first coming in neutral; and with others the big argument is that the control is dynamic. You pull back the lever to shut off the power and after shutting off the power a little further movement of the lever will apply the motor brake.

All of the electric makers are trying more than ever to get the electric car to more or less replace the gasoline limousine for theater work, and they deserve excellent credit for what they are accomplishing in this regard. The makers are doing this

SPECIFICATIONS OF AMERICAN ELECTRIC PLEASURE VEHICLES FOR 1912

Name and Model	Body Style	Price	Seats	Wheel-base	TIRES				BATTERY			Motor	Drive
					Kind	Front	Rear	Make	Number of Cells	Amp.-hr. Capacity	Mileage per Charge		
Argo A.....	Brougham.....	\$2800	4	110	Cushion....			Exide.....	30	60	60	Westingh..	Gear
Babcock 5.....	Runabout.....	1600	2	78	Pneumatic..	32x3	32x3	Philadel...	36	140	50	Diehl.....	Chain
Babcock 6.....	Victoria.....	1900	2	78	Pneumatic..	32x3	32x3	Philadel...	36	140	50	Diehl.....	Chain
Babcock 10.....	Coupe.....	2300	3	78	Pneumatic..	32x3	32x3	Philadel...	36	140	50	Diehl.....	Chain
Babcock 12.....	Roadster.....	2400	2	94	Pneumatic..	34x4	34x4	Philadel...	42	140	60	Diehl.....	Chain
Babcock 13.....	Roadster.....	2600	2	100	Pneumatic..	34x4	34x4	Philadel...	42	140	60	Diehl.....	Chain
Babcock 14.....	Brougham.....	2600	4	86	Pneumatic..	32x4	32x4	Philadel...	36	140	50	Diehl.....	Chain
Babcock 17.....	Coupe.....	2900	4	86	Pneumatic..	32x4	32x4	Philadel...	36	140	50	Diehl.....	Chain
Babcock 18.....	Coupe.....	2900	3	94	Pneumatic..	34x4	34x4	Philadel...	42	140	60	Diehl.....	Chain
Babcock 19.....	Coupe.....	3000	3	100	Pneumatic..	34x4	34x4	Philadel...	42	140	60	Diehl.....	Chain
Babcock 20.....	Coupe.....	3200	4	100	Pneumatic..	34x4	34x4	Philadel...	42	140	60	Diehl.....	Chain
Babcock 21.....	Town car.....	3250	5	105	Pneumatic..	32x4	32x4	Philadel...	42	140	60	Diehl.....	Chain
Babcock 22.....	Tourabout.....	3800	5	105	Pneumatic..	34x4	34x4	Philadel...	42	140	60	Diehl.....	Chain
Bailey.....	Roadster.....	2500	2	106	Pneumatic..	32x3	32x3	Edison....	52-80	150-250	80-120	Gen.Elec...	Chain
Bailey 1912.....	Phaeton.....	2600	3	81	Pneumatic..	34x3	34x3	Edison....	54	150	125	Gen.Elec...	Chain
Bailey.....	Roadster.....	2900	4	126		34x4	34x4	Edison....	60	225	200	Gen.Elec...	Chain
Baker W.....	Runabout.....	2000	2	80				Exide.....	30			Gen.Elec...	Shaft
Baker V.....	Coupe.....	2700	4	80	Optional...	Opt.	Opt.	Exide.....	30	135		Gen.Elec...	Shaft
Baker V.....	Victoria.....	2000	2	80	Optional...	Opt.	Opt.	Exide.....	30	112		Gen.Elec...	Shaft
Baker.....	Brougham.....	3100	4	92	Optional...	Opt.	Opt.	Exide.....	42	135		Gen.Elec...	Shaft
Baker.....	Brougham.....	3500	4	107	Optional...	Opt.	Opt.	Exide.....	42	135		Gen.Elec...	Shaft
Borland.....	Brougham.....	2500	4	92	Cushion....	32x3	34x3	Exide.....	40	128	75	Gen.Elec...	Shaft
Borland.....	Brougham.....	2200	4	92	Cushion....	32x3	34x3	Exide.....	40	128	75	Westingh..	Chain
Broc 20.....	Stanhope.....	2000	2	85	Optional...	Opt.	Opt.	Exide.....	28			Gen.Elec...	Optional
Broc 21.....	Victoria.....	2050	2	85	Optional...	Opt.	Opt.	Exide.....	28			Gen.Elec...	Optional
Broc 19.....	Roadster.....	2100	2	85	Optional...	Opt.	Opt.	Exide.....	30			Gen.Elec...	Optional
Broc 22.....	Coupe.....	2300	3	85	Optional...	Opt.	Opt.	Exide.....	28			Gen.Elec...	Optional
Broc 24.....	Coupe.....	2400	4	85	Optional...	Opt.	Opt.	Exide.....	28			Gen.Elec...	Optional
Broc 26.....	Coupe.....	2600	4	85	Optional...	Opt.	Opt.	Exide.....	30			Gen.Elec...	Optional
Broc 28.....	Brougham.....	2900	4	95	Optional...	Opt.	Opt.	Exide.....	40			Westingh..	Shaft
Broc 30.....	Brougham.....	3200	6	100	Optional...	Opt.	Opt.	Exide.....	40			Westingh..	Shaft
Century.....	Roadster.....	1750	2	92	Optional...	36x4	36x4		30	165	100		Shaft
Century.....	Brougham.....	1950	5	92	Optional...	36x4	36x4		30	165	100		Shaft
Columbus 1222.....	Coupe.....		4	83	Pneumatic..	34x3	34x3	Exide.....	30		65-85	Gen.Elec...	Shaft
Columbus 1230.....	Coupe.....		4	92	Pneumatic..	34x4	34x4	Exide.....	30		65-85	Gen.Elec...	Shaft
Columbus 1250.....	Coupe.....		5	100	Pneumatic..	34x4	34x4	Exide.....	36		65-85	Gen.Elec...	Shaft
Detroit 32.....	Victoria.....	2000	2	85	Optional...	Opt.	Opt.	*M.V.M....	38		65-100	Own.....	Shaft
Detroit 14.....	Victoria.....	2200	4	85	Optional...	Opt.	Opt.	*M.V.M....	38		65-100	Own.....	Shaft
Detroit 30.....	Roadster.....	2200	2	96	Optional...	Opt.	Opt.	*M.V.M....	38		65-100	Own.....	Shaft
Detroit 31.....	Coupe.....	2600	2	96	Optional...	Opt.	Opt.	*M.V.M....	38		65-100	Own.....	Shaft
Detroit 27.....	Brougham.....	2700	4	85	Optional...	Opt.	Opt.	*M.V.M....	38		65-100	Own.....	Shaft
Detroit 25.....	Brougham.....	2800	4	90	Optional...	Opt.	Opt.	*M.V.M....	38		140	Own.....	Shaft
Detroit 26.....	Brougham.....	2800	4	9	Optional...	Opt.	Opt.	*M.V.M....	38		140	Own.....	Shaft
Detroit 28.....	Town car.....	3500	7	112	Pneumatic..	34x4	34x4	*M.V.M....	38		50-75	Own.....	Shaft
Detroit 29.....	Limousine.....	3850	7	112	Pneumatic..	34x4	34x4	*M.V.M....	38		50-75	Own.....	Shaft

by bringing out bigger models. The most popular of these is what is termed the "All ride forward type." The title explains the body design—all of the passengers, four or five as the case may be, face forward. This means that the two front seats are individual ones, that on the left side for the person driving—please do not call that person the driver—and the one on the right for another passenger. In the full width back seat is room for two and often three adults. All of the passengers are in a single compartment, and all can take part in the conversation. The right-hand front-seat passenger can swing the revolving seat so as to face the rear, making it excellent for theater parties.

Some of the companies marketing vehicles of this design are: Baker, five-passenger; Woods, five-passenger; Waverley, five-passenger; Detroit, five-passenger; Rauch and Lang; Firestone-Columbus, four-passenger; and Ohio, five-passenger. All of these different types have their own seating peculiarities. On the Anderson or Detroit extension brougham, as it is called, the right front seat is an armchair effect and can be made to face in either front or rear position. On the Ohio, the model is known as the DeLuxe, and a feature of double control is added, so that either the person riding in the front left seat or in the rear left can drive. There is a complete control pillar with lever, etc., for each seat. When one is in use the other cannot be, so that there is not any danger of confusion resulting from two people trying to drive at the same time. On the new Woods the individual front seats are armchair types—very comfortable. The Waverley uses an individual type of seat, which is similar to some auxiliary tonneau seats in gaso-line cars, but which is very rigid. The Baker uses individual

arm chair types, with that on the right-hand side being pivoted.

The Hupp-Yeats, a newcomer, marketed but a coupé type in 1911, but for this year has added a line of brougham bodies which are much more elaborate and finely finished than the coupé line. The bodies are conspicuous by their heavily rounded rear corners, strongly in contrast with the square corner on the coupé. Then, too, gold-plated fittings are used as compared with silver and nickel fittings on the coupés. The wheelbases are longer, the broughams 100 inches, the coupés, 86 inches. This means much more leg room, it means a better suspension of the seats between the axles, which interpreted means easier riding; and externally the broughams are more palatial in appearance. They carry elaborate lights on the side of the body in rear of the door, the coupés do not. Chicago is the really big stronghold of electrics. Compared with the Windy City, Gotham is but a mere stripling. Chicago took to the electric early and the dealers here have all made money. In New York, as one maker expressed it, nearly every dealer has sunk from \$50,000 to \$75,000 trying to make a start and has generally given up in disgust. Chicago is ideally laid out for electric traffic. The boulevards lead into the loop and the lady can go from her home to the shopping district without being troubled with traffic for more than one short block. Nothing better could be desired. In New York it is different, as 3 miles of traffic must be passed through before getting into some parts of the shopping district.

While Chicago is the best field for electrics it has some very thriving rivals, who will require a few years to catch up but who are growing apace. One exhibitor in the armory thought that Kansas City should be given second place as a user of electrics. After this came California, Los Angeles being the

SPECIFICATIONS OF AMERICAN ELECTRIC PLEASURE VEHICLES FOR 1912

Name and Model	Body Style	Price	Seats	Wheel-base	TIRES				BATTERY			Motor	Drive
					Kind	Front	Rear	Make	Number of Cells	Amp.-hr. Capacity	Mileage per Charge		
Flanders.....	Coupe.....		4	100	Pneumatic.	32x3½	32x3½		24	140			
Fritchle.....	Victoria.....	2000	2	86	Pneumatic.	34x3½	34x3½	Own.....	28	120	100	Own.....	Shaft
Fritchle.....	Roadster.....	2100	2	88	Pneumatic.	34x3½	34x3½	Own.....	28	120	100	Own.....	Shaft
Fritchle.....	Touring.....	2400	4	100	Pneumatic.	34x3½	34x3½	Own.....	32	140		Own.....	Shaft
Fritchle.....	Coupe.....	3000	4	88	Pneumatic.	34x3½	34x3½	Own.....	32	140	85-90	Own.....	Shaft
Hupp-Yeates Regent.....	Coupe.....	1750	4	86	Pneumatic.	33x4	33x4	Exide.....	27		75	Westingh..	Gear
Hupp-Yeates Regina.....	Coupe.....	2500	4	86	Pneumatic.	33x4	33x4	Exide.....	27		75	Westingh..	Gear
Hupp-Yeates Patricia.....	Coupe.....	3000	4	100	Pneumatic.	33x4	33x4	Exide.....	30		100	Westingh..	Gear
Hupp-Yeates De Luxe.....	Coupe.....	4000	4	100	Pneumatic.	33x4	33x4	Exide.....	27		75	Westingh..	Gear
Hupp-Yeates Royal.....	Limousine.....	4500	5	100	Pneumatic.	33x4	33x4	Exide.....	27		75	Westingh..	Gear
Hupp-Yeates Imperial.....	Limousine.....	5000	5	100	Pneumatic.	33x4	33x4	Exide.....	27		75	Westingh..	Gear
Kimball Regular.....	Coupe.....	3000	4	82	Solid.....	36x4	36x4	Exide.....	42			Gen.Elec..	Optional
Ohio F.....	Victoria.....	2300	4	90	Optional...	34x4	34x4	Exide.....	30		90-130	Gen.Elec..	Shaft
Ohio Q.....	Victoria.....	2400	4	90	Optional...	34x4	34x4	Exide.....	30		100	Gen.Elec..	Shaft
Ohio D.....	Coupe.....	2600	4	80	Optional...	34x4	34x4	Exide.....	30		85-125	Gen.Elec..	Shaft
Ohio G.....	Coupe.....	2700	4	90	Optional...	34x4	34x4	Exide.....	30		85-125	Gen.Elec..	Shaft
Ohio K.....	Brougham.....	2900	5	90	Optional...	34x4	34x4	Exide.....	32		100	Gen.Elec..	Shaft
Ohio X.....	Coupe.....	4000	6	102	Optional...	36x4½	36x4½	Exide.....	41		100	Gen.Elec..	Shaft
Rauch & Lang 41.....	Stan. or Vic.....	2100	2	83½	Pneumatic.	32x3½	32x3½	Exide.....	24				Shaft
Rauch & Lang 43.....	Stan. or Vic.....	2250	2	83½	Optional...	Opt....	Opt....	Exide.....	24				Shaft
Rauch & Lang 425.....	Stan. or Vic.....	2350	2	91	Optional...	Opt....	Opt....	Exide.....	40				Shaft
Rauch & Lang 41.....	Coupe.....	2400	4	83½	Pneumatic.	32x3½	32x3½	Exide.....	24				Shaft
Rauch & Lang 44 & 45.....	Victoria.....	2450	4	91	Optional...	Opt....	Opt....	Exide.....	24				Optional
Rauch & Lang 43.....	Coupe.....	2550	4	83½	Optional...	Opt....	Opt....	Exide.....	24				Shaft
Rauch & Lang 444 & 445.....	Victoria.....	2550	4	91	Optional...	Opt....	Opt....	Exide.....	40				Optional
Rauch & Lang 444 & 445.....	Roadster.....	2600	2	91	Optional...	34x4	34x4	Exide.....	40				Optional
Rauch & Lang 425.....	Coupe.....	2650	4	83½	Optional...	Opt....	Opt....	Exide.....	40				Shaft
Rauch & Lang 43.....	Demi-Brough.....	2700	2	83½	Optional...	Opt....	Opt....	Exide.....	24				Shaft
Rauch & Lang 425.....	Demi-Brough.....	2800	2	83½	Optional...	Opt....	Opt....	Exide.....	40				Shaft
Rauch & Lang 44 & 45.....	Brougham.....	2800	4	91	Optional...	Opt....	Opt....	Exide.....	24				Optional
Rauch & Lang 444 & 445.....	Roadster.....	2800	2	91	Optional...	34x4	34x4	Exide.....	40				Optional
Rauch & Lang 444 & 445.....	Brougham.....	2900	4	91	Optional...	Opt....	Opt....	Exide.....	40				Optional
Rauch & Lang 44 & 45.....	Landaulet.....	3000	7	91	Optional...	Opt....	Opt....	Exide.....	24				Optional
Rauch & Lang 444 & 445.....	Landaulet.....	3100	7	91	Optional...	Opt....	Opt....	Exide.....	40				Optional
Rauch & Lang 454 & 455.....	Coach.....	3800	4	109	Optional...	Opt....	Opt....	Exide.....	40				Optional
Standard M.....	Coupe.....	1850	4	91	Optional...	Opt....	Opt....	Exide.....	30	135	90	Westingh..	Shaft
Studebaker 17-K.....	Coupe.....	1750	4	74	Optional...	30x3½	30x3½	Exide.....	32	112	50-60	Westingh..	Chain
Studebaker 17.....	Landaulet.....		3	71	Pneumatic.	30x3½	30x3½	Exide.....	26				Chain
Studebaker 17.....	Phaeton.....		4	71	Pneumatic.	30x3½	30x3½	Exide.....	26				Chain
Waverley 96.....	Vic. Phaeton.....	1850	4	89	Optional...	Opt....	Opt....	Exide.....	32	120	70-80	Own.....	Shaft
Waverley 90.....	Roadster.....	2000	3	104	Optional...	Opt....	Opt....	Exide.....	32	135	75-90	Own.....	Shaft
Waverley 93.....	Coupe.....	2150	3	89	Optional...	Opt....	Opt....	Exide.....	32	120	70-80	Own.....	Shaft
Waverley 91.....	Brougham.....	2800	4	89	Optional...	Opt....	Opt....	Exide.....	32	135	70-80	Own.....	Shaft
Waverley 98.....	Limousine.....	3500	5	104	Optional...	34x4	34x4	Exide.....	34	158	70-80	Own.....	Shaft



1—Ohio Model X De Luxe coupé

2—Baker 1912 extension brougham

3—Woods Model 1316 brougham

4—Front view of Waverley limousine

5—Ohio model K brougham

leading center west of the Rockies. Coming east he placed Cleveland, Detroit, Omaha, and Buffalo next. In the New England, east as well as along the Atlantic seaboard, the electric has made slow progress. Boston was a poor field, but it has more than doubled during the past year, thanks to the efforts of the Central station there which has advertised the possibilities of electrics in the Hub, both for pleasure and commercial uses. Washington, D. C. and Baltimore, Md., are poor for electrics: Philadelphia is developing very well; Cincinnati, is proving a big center; and Louisville, Ky. and Nashville, Tenn., are going to be big consuming centers within a few years. One maker showed statistics of the electrics registered in California from October, 1910, to October, 1911, in which time 442 were registered, which means that the sales were approximately that for this season.

Making the Electric Popular

The development of the electric is being immeasurably aided by the work of the central station, that is, the local electric light company which furnishes the current for charging purposes. In Boston and a few other cities the central station people have started clubs to boost the electric business; in others they hold luncheons once a week, to develop the business, and every effort they put forward is a boost for the electric pleasure car.

Returning now to the car itself: One of the first questions the visitor at the show booth asks the energetic salesman is "How many miles can it go on one charge?" The answers are very varied. Some salesmen are very conscientious and say from 55 to 70. As they put it—"You can get 70 miles on one charge on Michigan avenue and the Chicago streets, every day in the year, if you know how to nurse the car along, shutting off current well before you have to stop, and using the proper speeds." Getting mileage out of an electric battery is very much like getting mileage out of a gallon of gasoline in a gasoline machine. If you throttle down your gas and govern your spark carefully you can get good results and so with your electric, you must use brains and common sense. If you drive at 20 miles per hour you will not get so much mileage as when you drive at 17 miles per hour.

But it would not do to end the mileage story thus: Here are a few examples of ideas on mileage as gained from salesmen. The car names are omitted, because in many cases the salesman would lose his job as soon as the factory discovered what he was giving out. No. 1—"We get 60 to 70 miles regularly on third speed, but this varies more or less according to the weather." No. 2—"At 17 miles per hour you can get 90 miles out of every battery charge." No. 3—"We will guarantee 70 miles per charge on city streets, when running at 17 miles per hour." No. 4—"With favorable conditions you can get 50 to 60 miles per charge and with most favorable conditions you can get 70 miles." No. 5—"This will give 60 to 100 miles per charge without special trouble."

Nearly all of the visitors ask for the type of battery used at the different exhibits. In nearly every case options are given. The Anderson fit either Edison or lead types, sixty cells of Edison or thirty-eight cells of lead battery. The mileage ranges from 65 to 100. Waverley will provide lead plate, or Ironclad Exide batteries. Extra charge is made for the Ironclad type and Edison. On the Hupp-Yeats Exide standard and Ironclad are listed. On the new Flanders a special Flanders battery is installed. The Exide is used on the Woods. On the Ohio is the same equipment. On the Baker line, Exide and Hycap-Exide are listed with Ironclad Exide at additional cost.

The accessibility of the battery is a live topic with all of them. The divided idea is a popular one, namely carrying part of the battery in front under a short hood and carrying part in the rear under a rear hood. In either case the hood is hinged and can be lifted disclosing the entire battery equipment. An additional advantage is the better distribution of weight.

When it comes to the body features of the electric, everything must be done to please the ladies. They are often the buyers. When the men accompany them they get up in the seat and

listen to the salesman explain how foolproof the control is, how it is impossible to get into reverse without bringing the controller to neutral, and how, in one case, if you start off with the brake set, a bell will ring until the brake is released. In another case or two the salesmen explained how it was impossible to leave the car with one speed on, which would use up the current when the car was standing idle.

The roomy bodies are meeting with general approval. The rear seat is wider. Many claim it is wide enough for three persons, but in a few cases they would be hopelessly crowded. The wheelbases are a little longer with nearly every maker of electrics and the extra room has been used between the front and rear seats. The doors are also wider. On a Waverley four-passenger brougham the rear seat is 49.5 inches wide and from the front glass to the glass in the rear is 66 inches. The door is 23 inches wide.

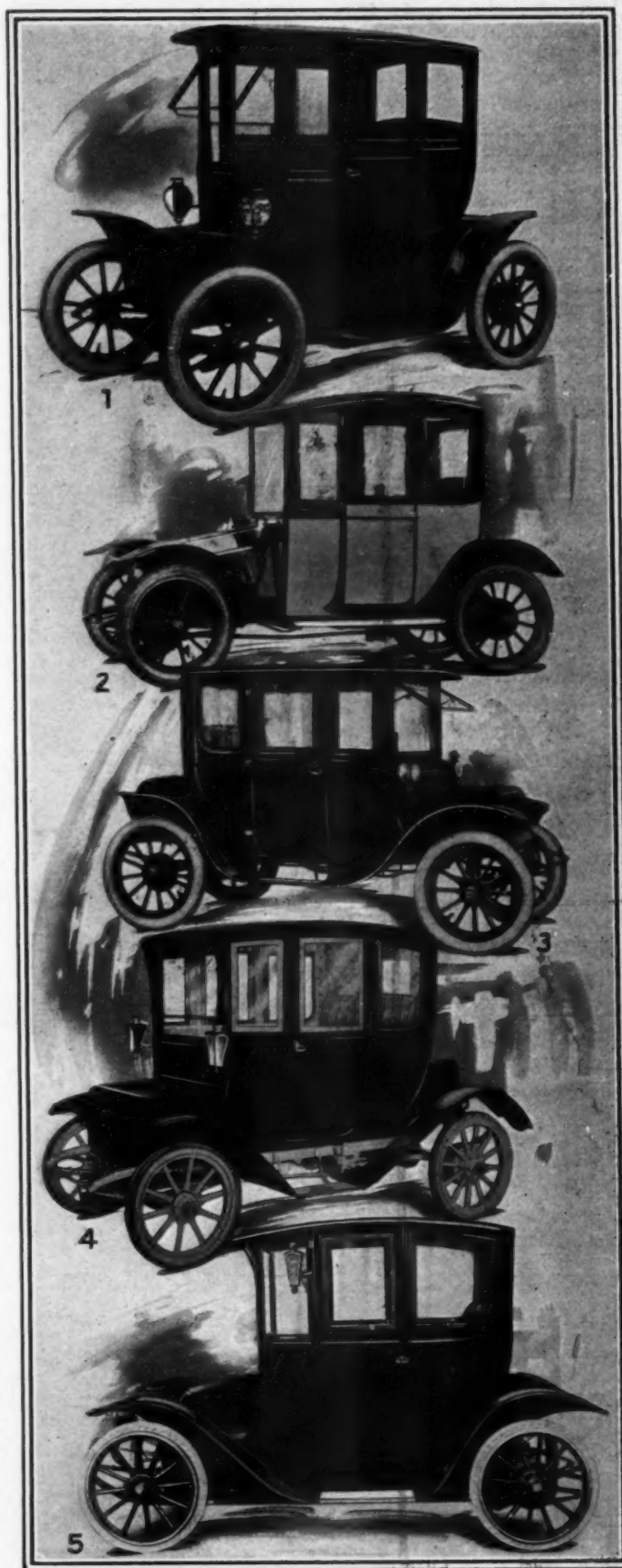
The wheelbase problem has been a big one with many of the makers and to solve it not a few makers have adopted two lengths, and in some cases three lengths. In general, the measurements between axles, or the wheelbase, ranges from 78 to 110 inches. This is a wide range. The majority of the new models brought out this year measure above the 100-inch mark. On the Hupp-Yeats models the coupés measure 86 inches and the broughams are all on chassis with 100-inch wheelbases. The Flanders uses but one length, 100 inches, and on this the body is suspended cradle-fashion between the axles. The front seat is 20 inches in rear of the front axle and the rear seat 20 inches in advance of the back axle. On the new shaftdrive Woods vehicles the wheelbases are 90, 92 and 108 inches respectively for four-passenger brougham, four-passenger coupé and five-passenger all-face-forward type. On the two new Baker broughams the measurements are 107 inches in the face-forward model.

Externally viewed, the electrics are a more sedate aggregation than a year ago. The fairy-glen coloring schemes of that time have gone, and the conservative black, brewster green, royal and other blues and maroons have taken their places. There is not a solitary gaudy-colored electric in the show. Even the striping is quiet. While nearly every maker has his standard colors, he will give any option that the buyer wants.

More latitude is seen in the upholstery. It can be suited to the whims of the lady buyer. It varies from morocco leather to French tapestry, with whipcords, broadcloths and silks. Gray whipcords are very popular. With coupés the leather is most in demand, and in broughams cloths have the lead.

Three New Waverleys—The Waverley line includes a new five-passenger limousine, a four-passenger brougham and a gasoline type of electric roadster. Such older models as Victoria phaeton, etc., are carried. The exhibit is made up entirely of new models. The company makes but one chassis design, varying the wheelbase and tire sizes for the different models. The Waverley drive is used, namely, mounting the motor immediately in advance of the back axle and driving through a transverse propeller shaft and herringbone gears. It is the same as manufactured for the last four years. Lever steering is used on all models excepting the limousine, in which an option of wheel control is offered. The chassis is fitted with two sets of mechanical brakes, one set pedal applied, expands within rear wheel drums, and the other brake is on the motor shaft. The rear-wheel brake drums are all larger, being increased from 8-inch drums with 2-inch face to 12-inch diameter with the same width. The wheelbase has been made longer all around. A rain-vision glass front greatly facilitates driving in rain or snow storms. The safety control factors make it impossible to pull the controller lever into reverse when going ahead with the power on. The I-beam front axle is used on all of these models.

Hupp-Yeats Introduces Broughams—The point of interest at this booth is the new brougham line, which are larger vehicles and more elaborate in every detail than the coupés. The Hupp-Yeats models are given special names: The DeLuxe is a four-passenger brougham, and the Imperial and Royal are five-



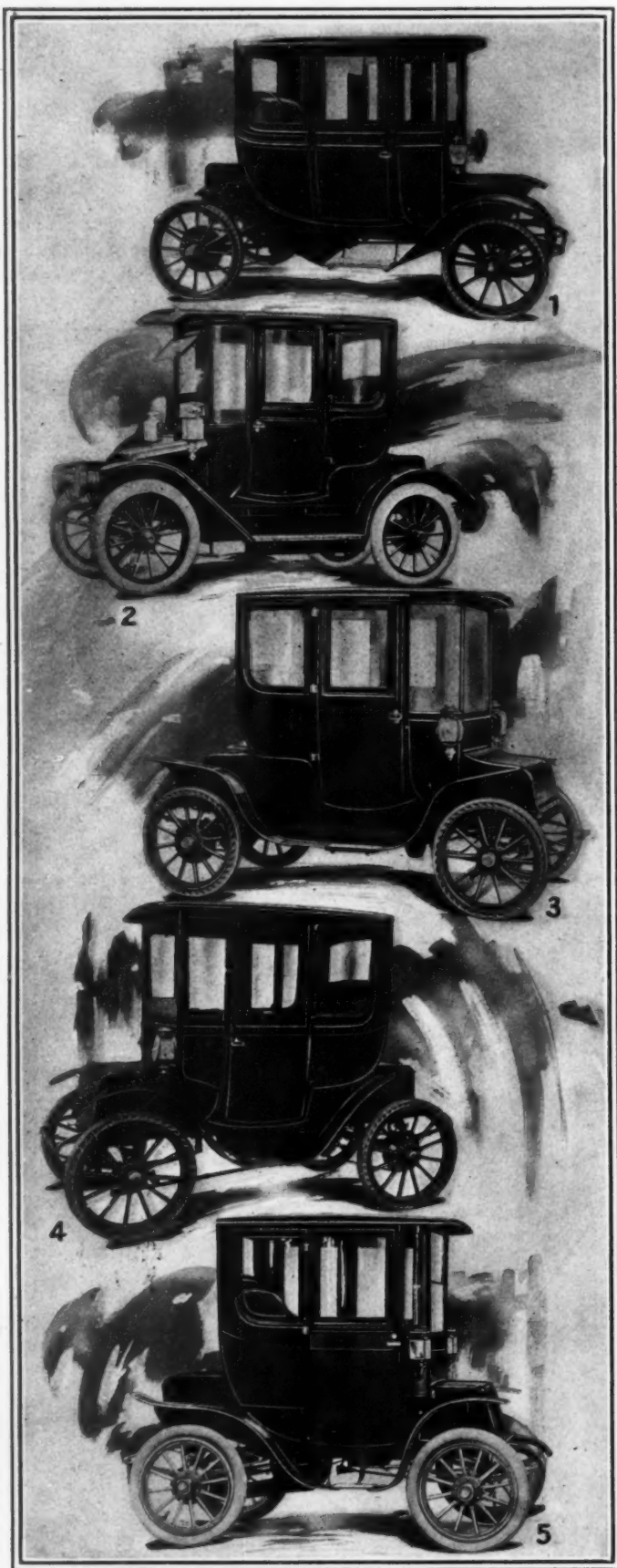
1—Columbus four-passenger coupé

2—Hupp-Yeats four-passenger coupé

3—Waverley Model 88 limousine

4—Borland brougham, with shaft drive

5—Church-Field, with underslung frame



1—Borland brougham, with chain drive

2—Babcock four-passenger coupé, Model 20

3—1912 Grinnell four-passenger coupé

4—Kimball Regular model coupé

5—Studebaker Model 17-K coupé

passenger broughams; Regent, Regina and Patrician are all coupé types. The low center of gravity is a point on all of these models, the running board at the side is but 12 inches from the ground, yet the chassis has a clearance of 8 inches. The coupé bodies this year are both longer and wider than those of last season. Both sets of mechanical brakes are expanding designs acting within rear wheel drums and having dustproof features. A floating axle is used. The Hupp-Yeats is a direct-drive design, the motor being a unit with the rear-axle housing and driving direct by bevel gear from the armature shaft of the differential bevel. A propeller shaft or chain is not needed.

Flanders With Worm Drive—The new Flanders, brought out late last season, is unique in that it uses worm drive to transmit direct from the motor shaft to the differential. The motor is a unit with the rear axle, being carried at an upward angle of approximately 45 degrees in front of the differential. On the end of the armature or motor shaft is a short worm which drives into the wheel on the differential, giving a speed reduction of ten to one. This electric is built in two models, coupé and victoria, both on the same chassis, which is, as already stated, characterized by the body suspension between the axles. The frame and quarter-elliptic front and rear spring at each side form a continuous curve, the side member of the frame being curved downward in the center to give a low door entrance. The tire equipment is typical of the entire electric field, namely, an option of either solid or pneumatic. If Motz cushion tires are used the size is 34 by 3.5 inches, and if pneumatics are used the size is a little smaller, namely, 32 by 3.5 inches. A straight tubular front axle is used with the Elliott jaw ends so designed that the pin holding the stub axle into the jaw inclines outward, and if continued downward would intersect the wheel plane where the tire rests on the ground.

Woods Introduces Shaft Drive—The line of Woods electrics is entirely new as compared with previous models. Nothing but shaft drive is shown this year. The motor is mounted longitudinally in the center, under the floorboards. It transmits by herringbone gear to the propeller-shaft and thence the transmission is direct to the rear axle. A torsion tube bolts rigidly to the motor housing and also to the rear-axle housing, thereby forming a unit of the motor and rear axle and eliminating universal joints in the propeller shaft. The motor is hung on a trunnion at either side, allowing for a front or rear swing to take up the deflection of the rear springs. The axle is a floating design, with the housing a stamping made in halves and electrically welded. The front spring is a combination platform and seven-eighths elliptic. The side part is seven-eighths elliptic and the cross or platform part is at the rear end of the side member. The rear springs are long scroll types. A specially heavy frame is used, with side members of channel section 4 inches deep. The front axle, a neat I-beam job, is a Krupp forging. There are two sets of mechanical brakes; one set expands within the rear wheel and is controlled by pedal; the other brake is on the front end of the motor shaft and is applied with the controller handle. An irreversible steering gear is fitted, with lever control. A commendable feature is enclosing all of the wires in conduits, making the wiring waterproof.

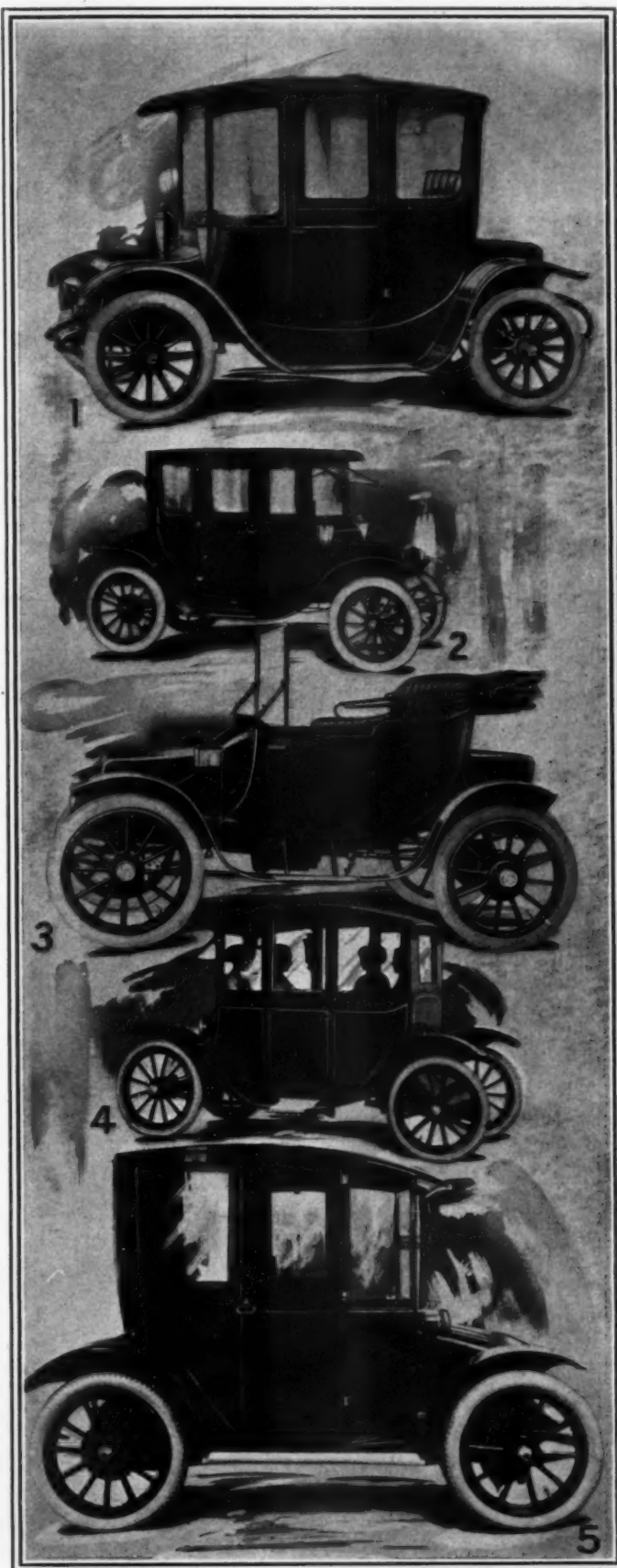
Two New Baker Models—The characteristic features of the Baker line are two new models, which are larger types than the others, one being a five-passenger, all-face-forward type and the other a five-passenger brougham. In addition to these there are such carried-over types as a roadster and other brougham designs. In the two new models shaft drive is used with a silent chain reduction between the rear end of the propeller shaft and the pinion shaft. On all of the older models the chain reduction is placed between the motor and the forward end of the propeller shaft. Rear springs on the new models are platform type, with the side springs mounted beneath the axle to give a low body support. Both models use a floating type of axle. Wheel steering control is used on the type with all of the seats facing forward, but a lever in the other new model. Brakes

are mechanical, and, like on the majority of electrics, are expanding types placed within the rear-wheel drums. Either solid or pneumatic tires are fitted. On the five-passenger brougham the size is 36 by 4 and 4.5 when Motz cushion tires are used, and when pneumatics are fitted the sizes are 34 by 4 and 4.5 on front and rear wheels, respectively.

Two New Detroit Models—The Anderson electric, familiarly known as the Detroit electric, has a line for this season which is more comprehensive than ever before. The two leading new models are one in which all of the passengers face forward, while the other is a limousine design of brougham, characterized by heavily rounded rear corners with corner windows placed between the side and back window, giving a well-lighted effect. All of the Detroit electrics have what is known as direct-shaft drive; that is, the propeller shaft connects directly with the armature of the motor and delivers the drive direct to the rear axle. In the Detroit electric the motor is located approximately under the center of the chassis and there is but one universal joint employed in the drive shaft. In this car the standard practice of using two sets of mechanical brakes is followed, both of which brakes are of the expanding type and located side-by-side within the rear-wheel drums. The safety factors of the control have been improved in that when the controller is locked, as when the car is left at the curb, the brakes are also locked. Pulling the controller lever back beyond neutral one brake equipment is set and when the controller lever is put into neutral and raised the brake is locked.

New R. & L. Coach and Roadster—One of the show features of the Rauch & Lang line is the coach, which is one of the new all-face-forward designs and has a wheelbase of 109 inches. The use of a frame with a 4-inch drop in the side members gives the body on this model, as well as on others, a low support, making easy entrance and exit to the car. Another new body model is the club roadster, a two-passenger vehicle with a tulip design of body and high foredoors. A heavily hooded dash is used, and the battery is carried fore and aft. Although all of the vehicles exhibited use shaft drive, chain transmission with chain cases is given as an option. In the shaft-driven models there is a silent chain transmission from the motor shaft to the front end of the propeller shaft. A foolproof control combination is used in that moving the controller handle back from neutral furnishes an electrical brake and a still further rearward movement applies a mechanical brake. This brake has a single pedal control, operating the rear axle brakes. The usual range of wheelbase is seen in these models beginning with a demi-brougham at 83.5 inches and going to the brougham and roadster at 91 and the coach at 109. In the rear wheel brakes a fine example of accessibility is found in that the fabric facing for the expanding-brake shoes is held in place by three T-head bolts mounted radially in the shoes with the cross-piece transverse of the shoe and resting in a recess in the shoe face when pulled home. It is a simple matter to loosen the three bolts, lift them out and put a new facing beneath them.

Ohio Has DeLuxe Model—The novelty at the Ohio exhibit space is the all-face-forward DeLuxe model which has double steering features, permitting of either the front or rear seat passenger doing the steering. In addition to this model the company has a complete line of shaft-driven types, including coupés, broughams, victorias and stanhopes. The Ohio chassis is a shaft-driven design, the motor being mounted longitudinally directly behind the front axle. A silent-chain transmits the drive directly to the forward ends of the propeller shaft, which is located immediately beneath the motor. This chain is inclosed. The motor is supported on the ends of the torsion tube which incloses the propeller shaft, the support at this point being a ball-and-socket design on a cross-member of the frame. A sliding sleeve construction is also incorporated to allow for spring movement. In order to lower the doors the side frame members are arched downward at this point. On the rear axle are two sets of mechanical brakes, both of the expanding type and located side-by-side.



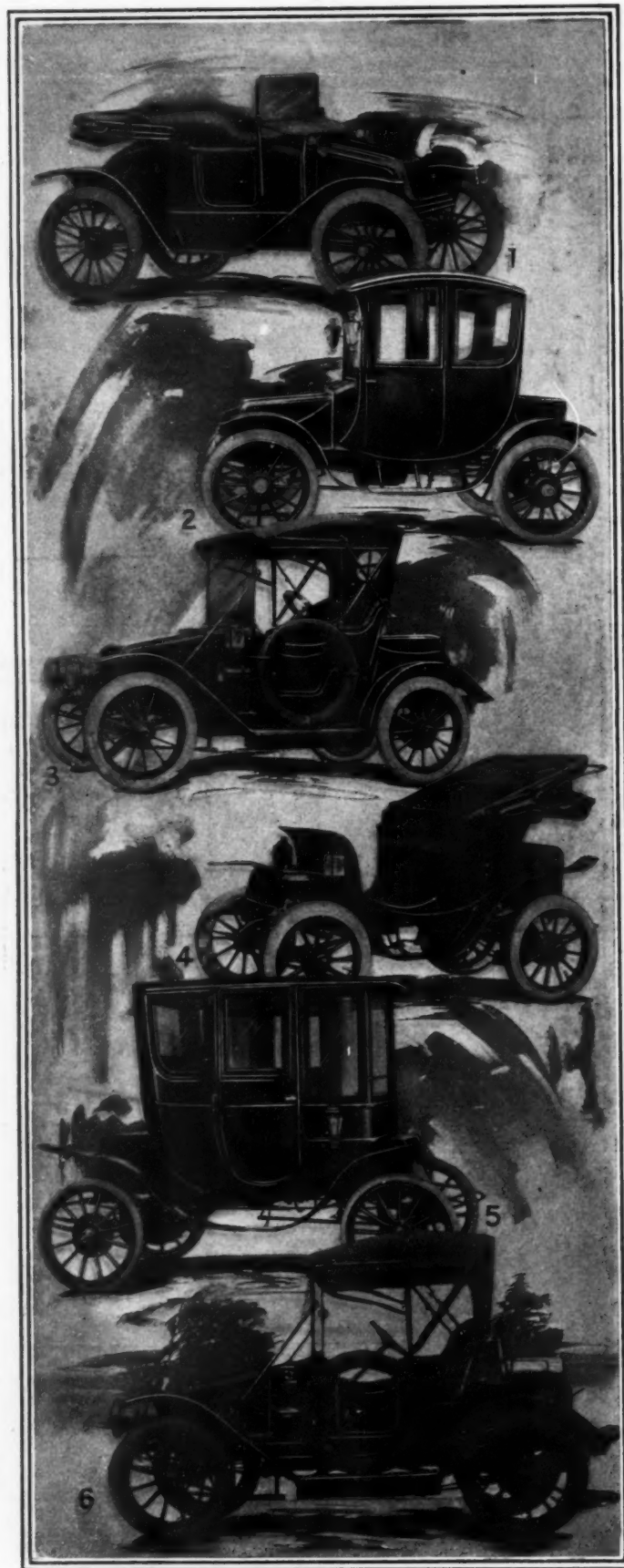
1—Broc Model 30 brougham shaft drive

2—Waverley five-passenger limousine

3—1912 Rauch & Lang stanhope

4—1912 Flanders, colonial type

5—Hupp-Yeats four-passenger coupé



1—Fritchle roadster, with sloping hood

2—1912 Rauch & Lang coupé

3—Babcock 1912 roadster, Model 18

4—Studebaker, victoria phaeton, Model 17

5—Waverley brougham, Model 91

6—Babcock roadster, with rumble seat

Columbus Has New Models—Two new models are shown of this make, one being a four-passenger colonial coupé and the other a four-passenger all-face-forward design. The model in which passengers all-face-forward is shown for the first time. The chassis is a shaft-driven type brought out last year. It uses a silent-chain transmission from the motor to the propeller shaft, the latter having one universal joint. Two sets of brakes are fitted, one expanding set being located within rear wheeldrums and the other a band brake on the propeller shaft. In order to lower the body the three-quarter elliptic springs are mounted beneath the rear axle. An option is given on cushion or pneumatic tires.

Broc's Colonial Coupé—The leaders in the Broc line are two colonial types of coupés, one a four-passenger vehicle and the other a six. In addition to these the company has its line of previous models, including broughams, victorias and stan-hopes. The biggest vehicle is the six-passenger coupé with facing seats and a distance of 60.5 inches between the backs of the seats. The new models make use of side-frame members with a 4-inch drop. The body feature is the dropping glass front, which leaves the sash at the top, thus not offering any obstruction to the view of the operator. All Broc chassis are shaft driven, transmission from motor to shaft being through silent-chain. The shaft is fitted with two universal joints.

Borland Drive Option—The Borland electric, which used to be known as the Ideal, a Chicago product, is made in two brougham types, one with shaft drive and the other with chain drive. The shaft-driven type is a new design and is a five-passenger vehicle with two movable front seats, the one at the left folding against the side of the body and the one at the right permitting of the occupant facing the rear or toward the left side. There is a Renold chain transmission from the motor to the propeller shaft. Brake equipment is a double set of expanding members located side by side.

Babcock Uses Chain Cases—A big improvement in the Babcock electrics of the chain-driven type is found in the use of aluminum chain cases permitting of the chain operating in oil at all times. While this is an improvement, it must not be conceived that all Babcock vehicles are chain driven. This is true of the model 17 coupé for five passengers, but the roadster model, and also some of the coupé types, are fitted with shaft drive. The characteristic of Babcock vehicles is the general use of a steering wheel, which is standard in all of the models, although an option is given on lever steering in some. Improvement in riding qualities has been obtained by an increase in the wheel-base of the different models. The general brake equipment varies. On one of the roadsters it is a double rear-wheel set, one being expanding and the other contracting, whereas on some of the coupé models there are expansion brakes on the rear wheels and a band brake on the countershaft.

Direct Drive on Standard—One of the new models of the past season to be marketed is the Standard, a vehicle characterized by straight-line drive with a double-gear reduction on the rear axle, one reduction being through bevel gears and the other through spur gears. The chassis of this model has been carefully designed to give a low center of gravity and also permit of maneuvering in cramped places. It is unique in the electric field in the use of a bottle-neck frame, namely, one in which the side-frame members are brought closer together at the dash so as to allow of shorter turning. In order to give a lower body support these side members are dropped in front of the rear axle so that so far as frame design is concerned this vehicle is in keeping with the latest in the gasoline field. Lower body support is further obtained by an I-beam front axle.

Grinnell Shaft-Drive Design—The Grinnell, a newcomer during the past year, markets a shaft-driven, extension-front brougham which seats five persons. The body design is made conspicuous by the large glass. The chassis has a wooden-frame construction with metal reinforcements and is supported in front and rear on elliptic springs. The motor, which is located well forward, transmits through a propeller shaft with two uni-

versal joints, there being a reduction between the motor and the propeller shaft. Low body carriage, in conjunction with the elliptic springs, is made possible by dropping the axles between the steering knuckles and the spring seat.

Bailey Electric Roadster—A somewhat novel vehicle in the electrical field is the Bailey roadster, a specially low-hung type, with a 106-inch wheelbase in length and resembling a gasoline car. The make-up of this vehicle combines wood frame with steel bracing, and the battery equipment of Edison cells, which is guaranteed to give a big mileage. The car is geared for high speed, a rating of 30 miles an hour being standard. The chassis design is different from the ordinary in that the motor is located in rear of seat and transmits by chain to the jackshaft.

Shaft-driven Argo—The Argo follows that class of newcomers in which the motor is made a unit to the rear axle, thereby obtaining a direct drive in that the armature shaft transmits direct by bevel gear to the differential. This vehicle has a long wheelbase, 110 inches in the five-passenger brougham body. This wheelbase permits of 24 inches between the front and rear seats, and allows of the rear seat being 20 inches deep and the front seat 18 inches. The framework is built around a pressed-steel chassis. Standard tire equipment is 36 by 4 inches.

Studebaker With Longer Wheelbase—A leading 1912 characteristic of model 17 Studebaker is increasing the wheelbase from 71 to 74 inches and giving optional upholstery, as well as optional standard body colors. The different Studebaker body types are all fitted on a single type of chassis with standard wheelbase, battery equipment, tires and control, so that the purchaser can buy two or three different body types which are interchangeable on the chassis.

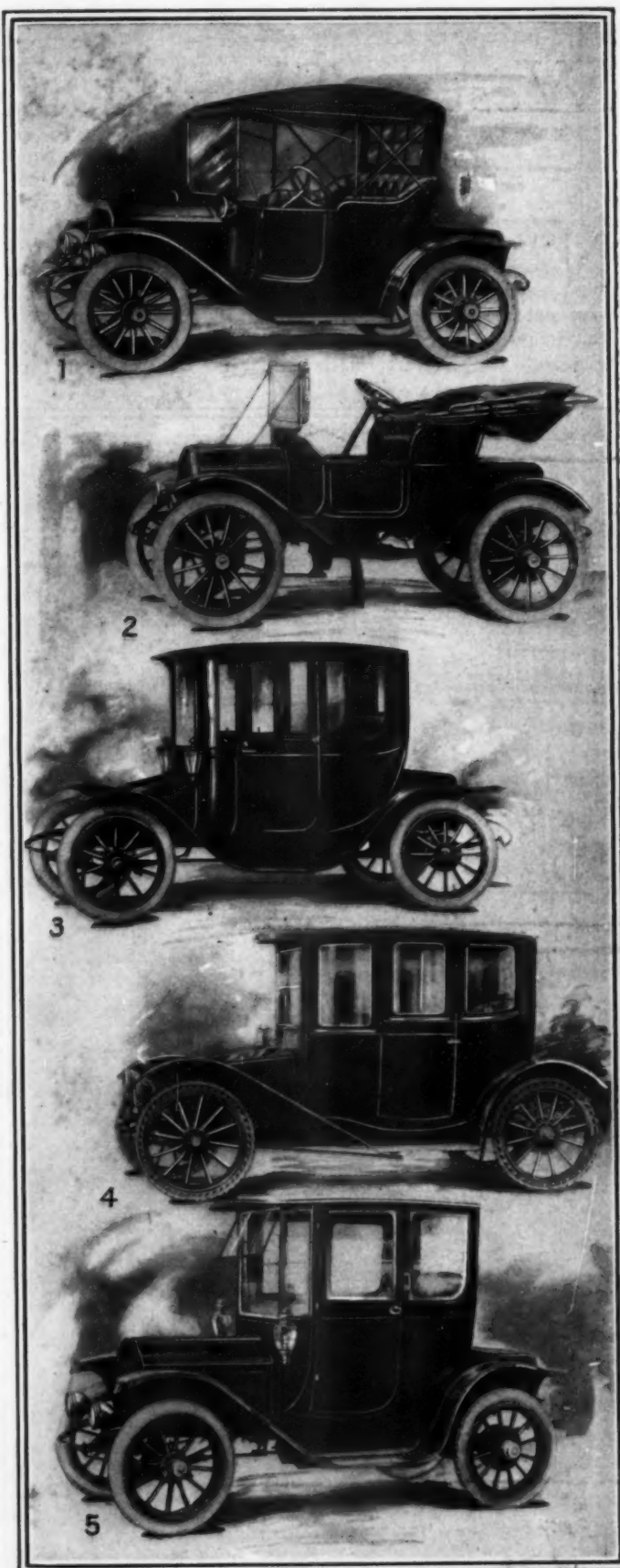
Kimball Optional Drive—Like several other electric manufacturers, the maker of the Kimball gives the buyer an option of shaft or chain drive and goes still further in offering any other type of drive desired. The coupé body is fitted with wheel steering, with an option of lever control. Being old-time carriage builders, it is natural that every detail of body improvement is incorporated in these vehicles.

Four Fritchle Models—Like the majority of electrics, the Fritchle is built in four models, coupé, victoria, torpedo roadster and torpedo touring car, the latter two being more or less novel in the electrical field. On all of these shaft drive is standard, the exact details of which are not obtainable at the present time. Pneumatic tire equipment is stock throughout. The Fritchle battery is used on all of the models listed, the equipment ranging from twenty-eight cells in the victoria and torpedo type to thirty-two cells in the other.

Colonial, New Electric—As with many of the more recent members of the electric family, the Colonial is at present made in one model, the four-passenger coupé. The interior of the body is roomy, and for inclement weather conditions the rain-vision glass front is made a feature. Further body comfort is provided by slides on the pedals, which cover the slots cut in the floor, thereby preventing any air currents. The chassis is a shaft-driven type with the motor located under the center of the body, and the drive transmitted by silent chain to the propeller shaft.

Century, New Detroit—In addition to the Colonial, another new Detroit is the Century, which made its debut at the recent Detroit show in two body lines, a coupé and roadster. Its chief point of interest lies in the use of an underslung frame, a design used in order to get that low body support which is being aimed at by all manufacturers.

Church-Field, a Michigan Electric—Among the army of newcomers is the Church-Field, an electric resembling the Century in the use of an underslung pressed-steel frame, but going one step further in the field of gasoline imitation in that it uses a two-speed gearset, this being the first instance on record of gearset being employed in an electric car. As with the majority of other electrics, it is a shaft-driven design, the shaft incorporated in a torsion tube so that but one universal is needed.



1—Detroit Model 30 two-passenger roadster

2—Baker runabout, straight-line hood

3—Standard four-passenger coupé

4—Argo brougham, a new-comer

5—Detroit Model 31 coupé

Western Shows Disclose Marked Progress

Taking Up Gasoline Cars Not Formerly Reviewed

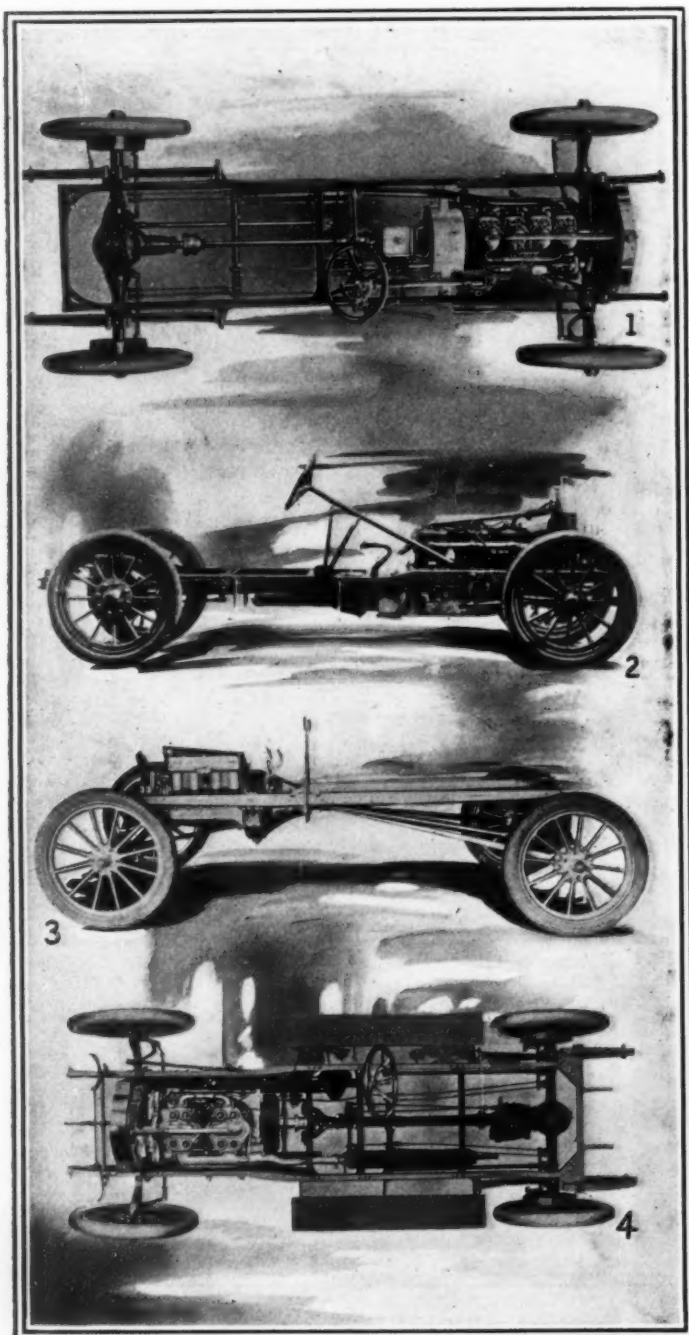
NOW that the show epidemic has reached the Western centers it may be well to take advantage of that fact and study the trend of development in the cars which were not among those represented at the New York shows. The following notes show the prominent changes which have been made in these cars, which are for the most part of West-

ern manufacture. Few, if any, radical motor changes have been made, but there are many minor body refinements tending toward a better and more comfortable car. The development of the coupé is nation-wide. This useful little car, which has been hailed with delight by physicians and others who ride in all kinds of weather, seems to be the answer to the problem of adopting the runabout as an all-year-round car. It will be noted that demountable rims and self-starters of various types attract about as much attention this year as anything else, while in the line of minor refinements foredoor ventilators and increased general accessibility will be noted. Some new cars will be found in the list, and these are generally of the low-priced type with a single chassis design.

Alpena Makes Seven Models—There are seven models for the year included in the Alpena line, while there are but two chassis, a 30 horsepower and a 40 horsepower. The motor sizes are 4 inches by 4 inches and 4 1-8 inches by 5 1-4 inches. Each has its cylinders cast separately. The higher-powered chassis has a multiple-disk clutch, while the smaller uses a cone clutch; and while the latter has a floating rear axle the former is constructed with a semi-floating type. The wheels are 36-inch on the larger model and they are 2 inches smaller on the other. The wheelbases are 120 inches for the 40-horsepower chassis and 112 inches for the 30 horsepower. The axles on both are of I-beam section, in addition to which dual ignition, centrifugal pump and splash lubrication are also found on both models.

Apperson Has Many Changes—Two new models have been added to the Apperson line, bringing the total up to seven models. A roadster and a five-passenger body are placed on the 4-45 chassis, which has a 114-inch wheelbase, the motor being 4 1-2 inches by 5 inches, the tires having dimensions of 34 inches by 4 inches. The same size tires are also placed on the 4-55 five-passenger car, which has a motor with dimensions of 4 3-4 inches by 5 inches, and a 118-inch wheelbase. The seven-passenger special uses this same motor, while the wheelbase is 4 inches longer and the tires are 36 inches by 4 1-2 inches. A coupé model is mounted on the 4-45 chassis, while a 4-65 with a motor having dimensions of 4 1-2 inches by 5 inches is also manufactured. This latter is the same chassis as that used for the Jack-Rabbit roadster, but the body is a seven-passenger foredoor model. As to motor changes, the fan has been made adjustable and the oiler has been placed in the bottom of the crankcase. The tubular radiator has given way to an improved cellular type, and dual ignition has been added to take the place of the former double system. All models are equipped with demountable rims.

Austin Adds a Higher-powered Model—The latest addition to the Austin coterie is the model 77, which is a six-cylinder machine with a motor holding the American record for stroke length, this being 7 inches. The bore is 4 1-2 inches. The cylinders are of the T-head type and they are cast separately, being mounted on the crankcase on the slant to allow clearance between the cams and the connecting rods. This is made necessary owing to the exceedingly long stroke. On this new engine three sets of spark plugs are used, there being eighteen in all. Two of the three accorded to each cylinder are placed one on either side of the water manifold connection in the head, while the third is mounted in the inlet valve cap. This latter plug is used for battery ignition, while the other two are fired simultaneously by a two-spark Bosch magneto. The frame of this model 77 presents a very substantial construction, it being 4 3-4 inches wide and 6 inches deep at its smallest part. The inside



1—Plan view of the Alpena chassis
2—Chassis of the six-cylinder Havers
3—Chassis of the Model T Ford
4—Plan view of the Republic chassis

line of this frame is straight along its entire length, thus eliminating any weakness due to frame angularity. There are four speeds and center control. The drive is of the left-hand design.

The other models of this line remain practically as they were with the exception of a few minor changes. The six-cylinder models, 45 and 50, with engine sizes of 4 1-8 inches by 5 1-4 inches and 4 1-2 inches by 6 inches, are retained. Both of these are shaft driven, have multiple-disk clutches, three speeds forward and reverse, two double universal joints, one being located on either side of the transmission gear, seat adjusting multiple-jet carbureters and quick-detachable tires.

In addition to its other features, the new model 77 has a 72-inch plate clutch and a ball-and-socket form of center control lever. The differential gears are off-set and the springs are hung underneath the rear axle. The wheelbase is 141 inches and the tires are 37 inches by 5 inches.

Bellemobile Just Produced—The Detroit show has brought to light a new two-passenger roadster made by the Bell Motor Car Company. The wheelbase is 100 inches. A 20-horsepower motor cooled by thermo-syphon system, multiple-disk clutch, Bosch magneto, elliptic rear springs, semi-elliptic front springs, selective sliding gear transmission, 30-inch by 3-inch wheels and a low torpedo type of body mark this new product.

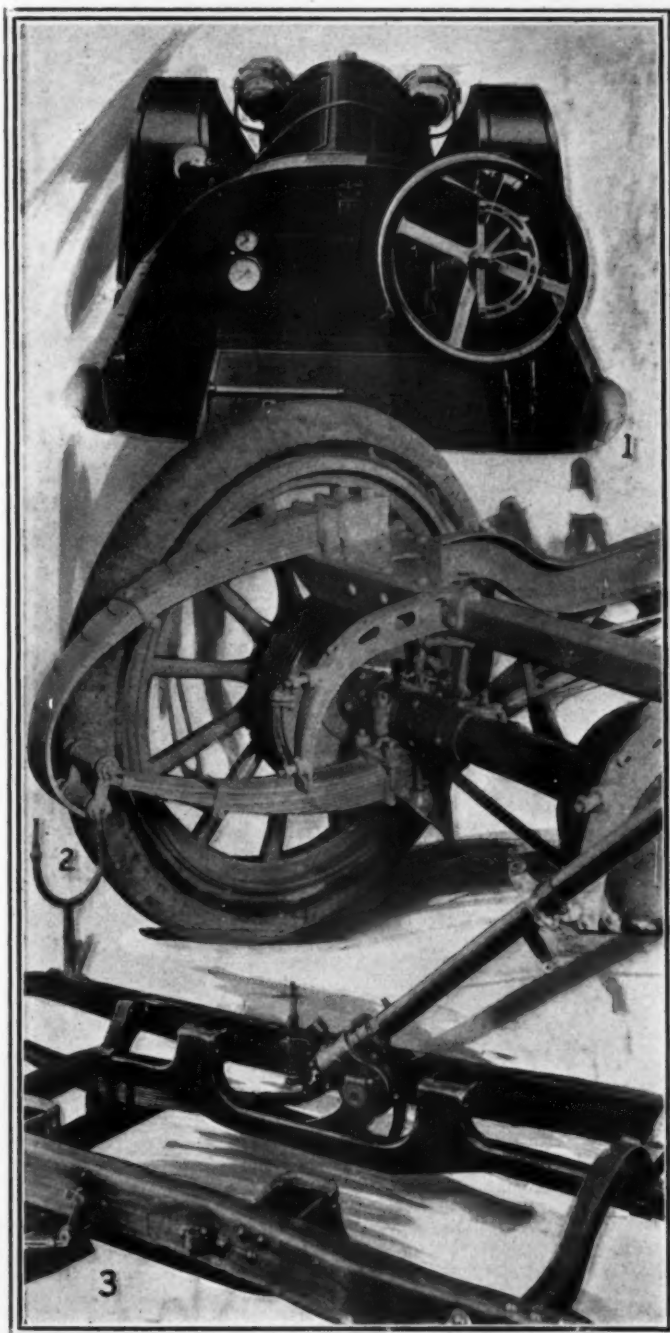
Coe Flyer a New Product—This car is entirely a new proposition for this year. The motor is a 50-horsepower, six-cylinder, T-head type, with the cylinders cast in threes. The bore and stroke are 4 by 5 inches, and there are three crankshaft bearings. The oiling is by means of a force-pump, and the cooling system consists of fan, pump and honeycomb radiator. A high-tension Bosch magneto is used as well as the new type Schebler model L carbureter. The clutch is made up of thirty-nine saw-metal disks, and a three-speed selective transmission is included. The rear axle is of heavy design of the semi-floating type, while the front axle is of I-beam section. Both brakes are internal expanding on the rear wheels. The tire equipment consists of 36-inch by 4-inch tires all around, the rims being demountable. Six body types are constructed on this chassis, a five-passenger straight-line body being the cheapest and a five-passenger torpedo the highest in price. The wheelbase is 124 inches and the tread standard.

Few Differences in Colby Cars—None of the eight Colby models have been dropped for this year, and there are no changes of note in the existing models. The motor, ignition, lubrication and the clutch remain as they were, but the gearset of the model H has been altered. It is now internally operated, control, set tube and shaft terminating in the gearset case. The steering wheel and its gear have been left as they were. The body designs, however, have been altered. A new flush-sided foredoor body, which has its door latches within, has been brought out on the model H. Five inches more room has been added to the front seat on the model, also.

In regard to the details of the power plants of this line, it might be said that they are of two horsepowers, namely, 40 and 30. The motor of the former is an L-head type, the cylinders being cast in pairs. The bore is 4 1-8 inches and the stroke 5 1-4 inches. The other motor is also of the L-head type, and its dimensions are 4 inches by 4 1-2 inches. Both are water-cooled, and the fans are belt-driven. Tubular radiators are used. On the higher powered engines Eisemann dual magnetos are used, and on the 30 horsepower a Splitdorf dual system is employed. The latter chassis is also equipped with cone clutch, while the other model has a multiple-disk design. The wheelbases of the two models are 121 inches for the 40 horsepower and 116 inches for the other. Both brakes of the 40 are internal expanding and semi-elliptic front and three-quarter elliptic rear springs are used, while on the 30 the brakes are internal and external expanding and the entire spring equipment is semi-elliptic.

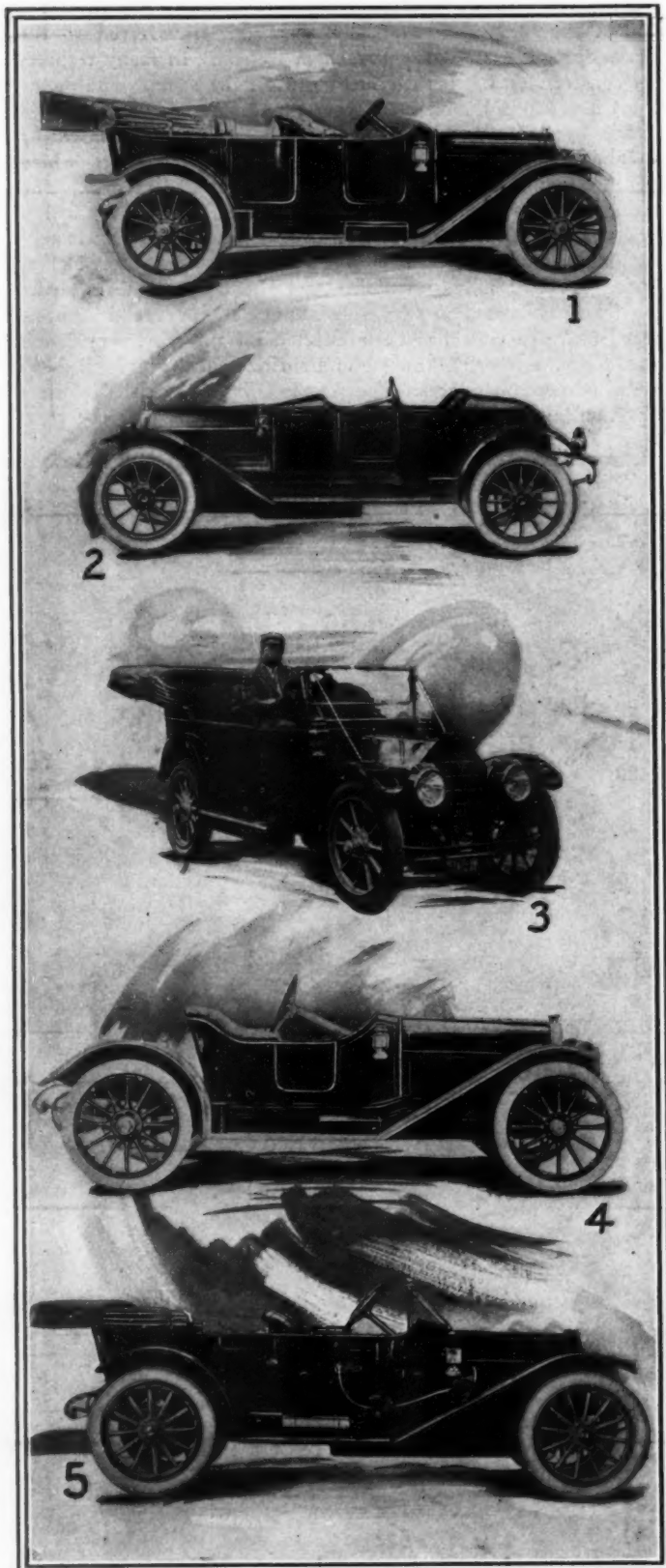
Courier Claremont Model—The new Courier model is to be known as the Claremont. This car, which was formerly

manufactured by the Dayton Motor Car Company branch of the United States Motors Company, has been transferred to the Brush Runabout Company branch in Detroit. In many respects the construction of this car has been left the same. The motor is of the L-head monobloc type, the dimensions being 3 7-8 inches by 5 1-4 inches. The valve springs are enclosed by aluminum plates. The clutch consists of fifty-one disks, which run in oil, and there are three speeds forward and reverse. The frame is offset just behind the motor over a length of 7 inches to do away with any ill effects which might arise from weakening due to angularity. The offset amounts to about 2 inches. There are two universal joints and the cross-members make the frame construction very substantial. A very good disposition of grease cups has been effected on this car, they being placed on the steering knuckle and spring shackles as well as in the usual accepted places. The rear axle is of pressed-steel construction, and 54-inch half-elliptic springs are used on the rear.



1—Inside view of the Apperson Jack-Rabbit roadster
2—Rear suspension of the 1912 Republic

3—Steering mechanism of 1912 Republic



1—Halladay touring car, with cowl dash
 2—Lexington roadster, with torpedo body
 3—Glide touring car, straight-line body
 4—Halladay, Model 40, roadster type
 5—Kissel-Kar 50 horsepower semi-touring

Crow-Elkhart Offers Great Variety—Motors of five different horsepowers are placed in the five types of chassis of Crow-Elkhart manufacture. There are twelve body types to be had, and the horsepowers of their motors range from 25 to 45. Six of the models, namely, 51, 52, 53, 54, 60 and 61, have a motor the

bore of which is 4 inches and the stroke 4 1-2 inches. The cylinders of this motor are cast in one piece, and the inlet and exhaust manifolds are cast integral. The motor next in size and which is used in model 55 has its cylinders cast in pairs, as have also the motors of models 56 and 57, with dimensions of 4 5-16 inches by 4 7-8 inches. Models 58 and 59 have motors whose cylinders are likewise in pairs, the strokes being 5 inches and the bores 4 1-2 inches. Located in the crankcases of these various motors are four oil compartments to which the oil is pumped by plunger pumps, which are gear driven from the camshafts. The oil supply is carried in reservoirs at the bottom of the crankcase in these engines, and the cranks lubricate the cylinders by splash. Multiple-disk clutches are used, and the transmissions are carried on the rear axles. Cooling is effected by means of thermo-syphon arrangements. Models 50 and 61 have right-hand control, while on all the other models the levers are located in the center.

Cunningham Changes Few—All Cunningham types are mounted on the one chassis, the motor of which has dimensions of 4 3-4 inches by 5 3-4 inches and having 40 horsepower. The unit power plant construction is a feature of this machine, its appearance being very substantial. All parts of the motor and transmission are designed with a view to their accessibility, and removable covers are placed conveniently for access to parts which are enclosed. The valves are all located in the heads of the cylinders, and they are completely enclosed by easily removable aluminum covers, preventing the accumulation of oil and grease around them. A new feature of the motor construction is the addition of a gear on the left side, to the shaft of which a generator for lighting purposes may be added, if desired. While this lighting machine is not placed on the car as standard equipment, it is thus made easily attachable. Ignition is accomplished by Bosch magneto of the dual type, one set of spark plugs being required. A gear-driven centrifugal pump takes care of the cooling-water circulation. Three forward speeds are provided, as well as splash lubrication, shaft drive and leather-faced cone clutch. The wheelbase is 134 inches, the tires are 36 inches by 5 inches, and the rear axle is of floating Timken construction. An I-beam front axle is used.

Davis Offers a 40-Horsepower Model—The Davis car is constructed on a chassis having a wheelbase of 112 inches. The motor is of the latest Continental type with bore and stroke of 4 1-8 inches by 5 1-4 inches. All valve lifts and springs on this motor are enclosed, preventing dust and grit of any kind from coming into contact with the valve stems, push-rods or guides. The motor is water-cooled by means of a centrifugal pump, and oiling is accomplished by means of a gear-driven plunger pump. The radiator is of the cellular type, the carburetor a Schebler, the magneto a Bosch dual and the clutch a leather-faced cone. Center control is used, it being mounted directly on the transmission, which is selective of the three-speed type. Front suspension is taken care of by semi-elliptic springs, while in the rear a three-quarter elliptic platform construction is used. The tire size is 36 inches by 4 inches.

Detroit a New Car—The Detroit makes its appearance for the first time this season. The motor has a bore and stroke of 3 3-8 inches by 4 3-4 inches, and the cylinders are of the L-head type, valve springs being enclosed, push rods are adjustable and the accessibility and simplicity are of note. The crankcase is of cast aluminum of the barrel type and the fly-wheel housing, to which the gearset and clutch housings are bolted, is made integral with the crankcase. Easy access to the connecting rods is afforded by means of a removable plate at the bottom. An oil reservoir is contained in this plate. A combination force-feed and splash system takes care of lubrication to all parts of the motor. The motor crankshaft is mounted on two annular ball bearings, cooling is effected by means of thermo-syphon and a Bosch high-tension magneto is used for ignition. Left-hand drive and center control are features. The rear axle is housed by pressed-steel and webbed construction, driving and differential gears being mounted on the removable carrier.

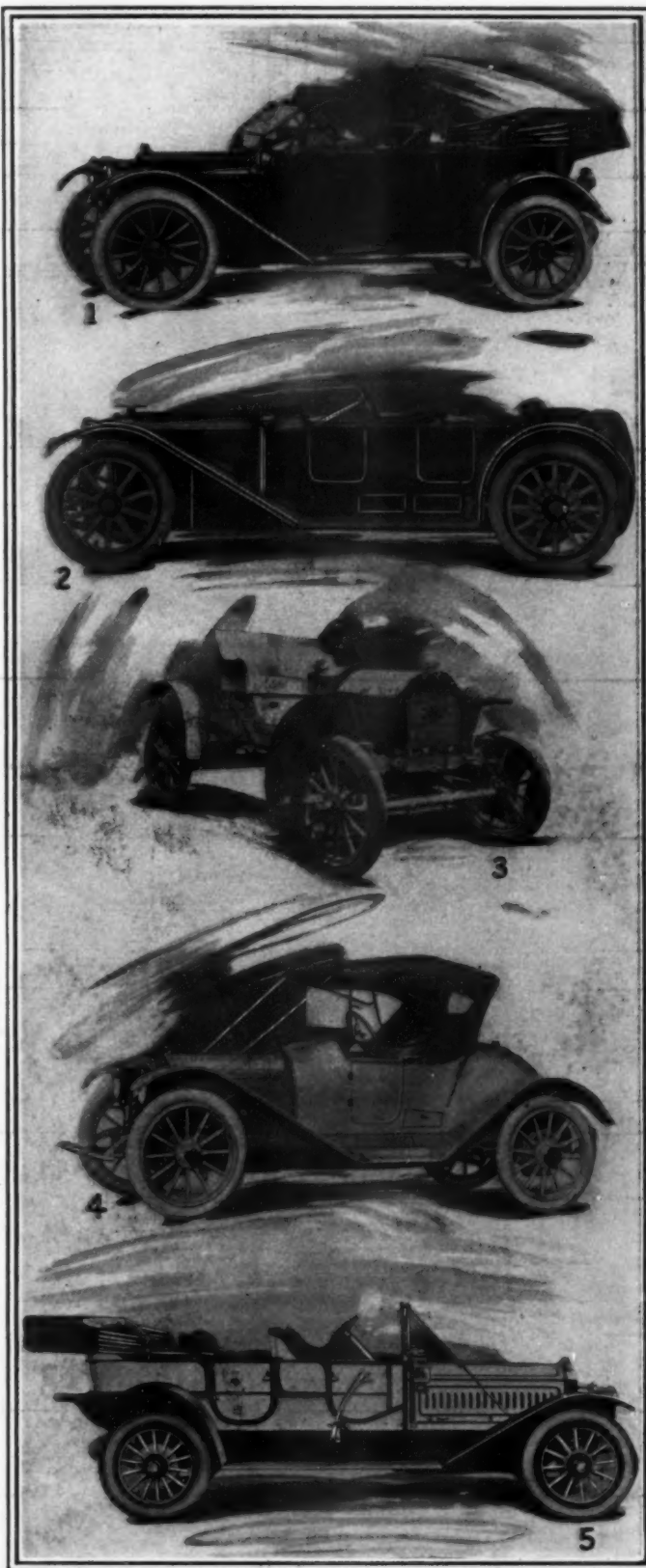
Ford Model T Continued—The torpedo runabout, commercial roadster, delivery car and foredoor town car are all mounted on the model T chassis. Very few changes of any importance whatever have been made in this line of light cars. Slight change has been made in the construction of the commutation, tending to increase its efficiency. A master vibrator has been added to take the place of the former separate vibrators for each cylinder. A slight improvement has been made in the rear axle in that the wheels are now fastened on with a locknut and taper in place of the earlier method of straight bearing and pin. A door has been placed in the crankcase, lending added accessibility to the connecting-rod. The transmission cover has been changed, making it possible to get at the planetary transmission for adjustment by the removal of half a dozen screws. Formerly the entire cover had to be removed. The valve springs have also been inclosed.

Glide Adds a New Model—The latest Bartholomew product is the 36-horsepower Glide car. The bore and stroke of the new motor are 4 1-8 inches by 5 1-2 inches, and the cylinders are cast in one block of the L-head type. The dimensions of the 45-horsepower motor of this make are 4 3-4 inches by 5 inches. The magneto and pump are located on the right side of the new motor, while the inlet manifold is cast integrally with the cylinders. The exhaust manifold and carbureter connection are made of cast iron. There are three crankshaft bearings, four connecting-rod bearings and three camshaft bearings. The lubrication is by means of a constant-level splash system, the oil pump being of the double-piston type. The clutch is composed of fourteen plates, which is an addition of three over last year. There are three speeds forward and a reverse, while Timken roller bearings are used throughout with the exception of one annular bearing on the clutch shaft.

Halladay Has Three Models—Three separate chassis are put out by the Halladay. These are the 30, 40 and 50 horsepowers. The engine sizes are 3 3-4 inches by 5 1-4 inches; 4 inches by 4 1-2 inches, and 4 inches by 4 3-4 inches respectively. On the 30 horsepower the front axle is semi-floating, the carbureter a Schebler and the clutch a cone type. The control lever is placed inside. The ignition is by dual system, the cooling by centrifugal pump and honeycomb radiator, the front springs are semi-elliptic and rear springs elliptic, tires are 32 inches by 32 1-2 inches. On the two larger models multiple-disk clutches replace the cone clutch of the smaller type. The rear-spring equipment of these two differs from the smaller model in that three-quarter elliptic springs are used. The tire sizes for the 50 and 40 are 36 inches by 4 1-2 inches and 36 inches by 4 inches. Few changes of note have been made in the model 30 excepting the addition of the self-starting device and the option of either quick-detachable or demountable rims. The same may be said of the 40 in regard to changes, but the 30, which is entirely new this year, has a wheelbase of 112 inches and a new Rutenber block motor.

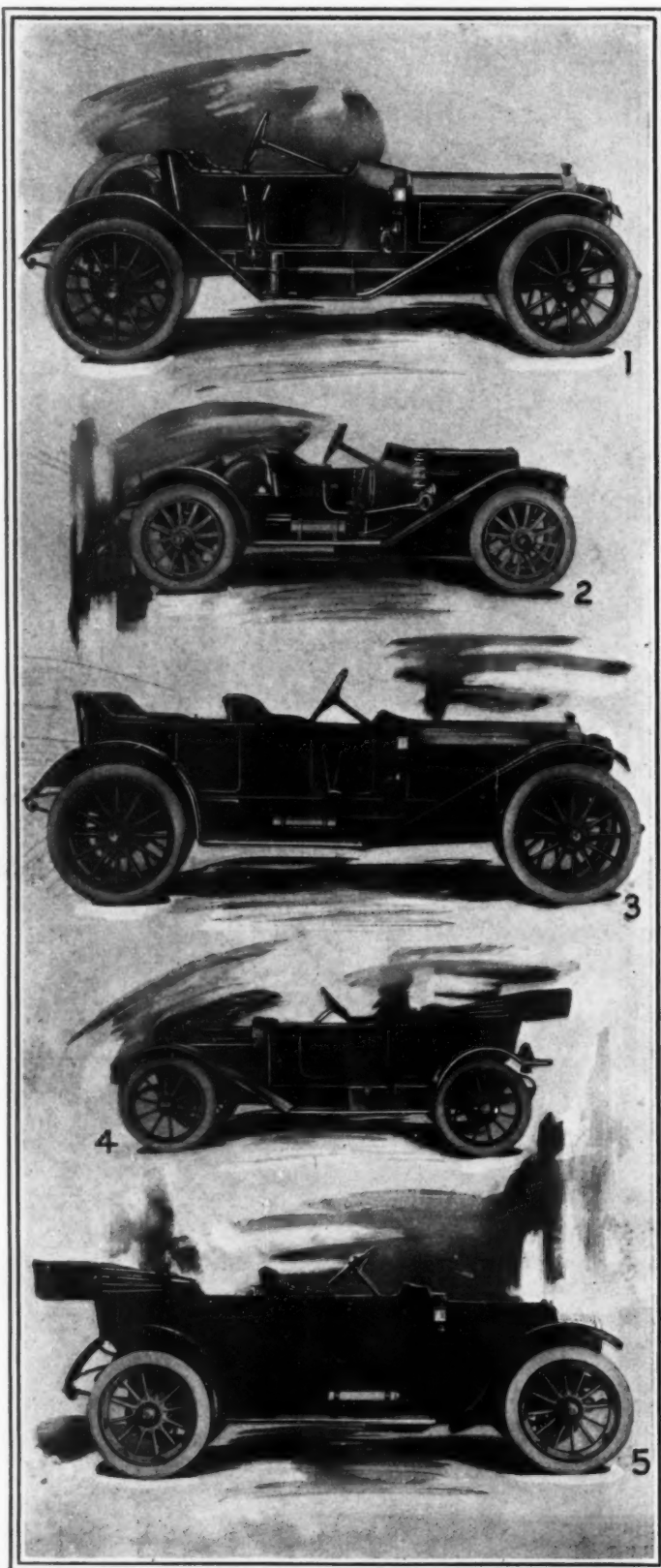
Havers Has Single Chassis—All body types in this line, which number three, are placed on the one chassis, which is equipped with a self-starting, six-cylinder motor. This motor develops 44 horsepower, having a long stroke of 5 inches and a bore of 3 3-4 inches. The valves are enclosed by means of housings cast integral with the cylinders and they are covered by aluminum caps held in place by thumb nuts. The clutch is of the multiple-disk type inclosed in the housing which surrounds the flywheel. Transmission is selective, ignition by Bosch system, carburetion by Stromberg carbureter and control levers are located inside the body.

KisselKars in Two Models—The latest addition to this line is the 40-horsepower model having a bore and stroke of 4 1-2 by 4 3-4 inches respectively. The 50-horsepower machine, with bore and stroke of 4 7-8 inches by 5 inches, has been retained. Both of these models have motors with L-head cylinders and the valve springs are inclosed for the first time this year. In other respects changes are very small. In addition to these two models, the 30-horsepower, four-cylinder and six-cylinder types



1—Republic touring car, straight-line body
2—Norwalk underslung torpedo touring car
3—Liberty Brush, popular little car
4—Republic roadster, with rear compartment
5—Austin six-cylinder touring car

are also made. The motors of these latter two have the same general construction as the former. On the 30 and 40 a leather-faced cone clutch and three-speed transmission are used and four-speed on the other two. Rear axles on all models are floating and internal and external brakes on the rear wheels are used on



1—Havers roadster, with cowl dash
 2—Kissel 30-horsepower semi-racer
 3—Havers four-passenger touring car
 4—Lexington four-cylinder touring car
 5—Apperson Jack Rabbit 4-45 touring car

all models. Either Bosch or Mea types of ignition systems may be had. Magnetos are accessibly placed on the same shaft with the water pumps, and provision is made for the easy removal of either of these accessories if necessity for such a process should arise.

Lambert Confined to Five Models—The Lambert line this year will be confined to five models, the model 66-C being the leader. Models 66-A and 66-B are equipped with 35-horsepower motors. As formerly, all models are equipped with friction transmission system. Models 99-A and 99-B have 40-horsepower Rutenber motor. The Lambert 35-horsepower motor is a ball-bearing design with cylinders cast en bloc. Bore and stroke are 4 1-8 and 4 1-4 inches respectively, with crankcase divided into two halves, the upper containing all the bearings, the lower forming the oil pan and reservoir. The motor is of the L-type and the camshafts and cams are drop forged in one piece. The ignition is by Remy dual system and splash lubrication provided for. The motor is carried in the frame on three points despite the fact that the power plant is not a unit. As regards chassis construction, full-elliptic rear and elliptic front springs, Renold silent-chain drive from jackshaft to rear axle and the usual equipment of internal and external expanding brakes are to be found. The wheelbases of the various models are 115 inches for the 99-A, 117 inches for the 99-B, 112 inches for the 99-C, 107 inches for 66-B and 112 inches for the 66-C.

Two New Lexington Products—Two new Lexington models have been added for the year, one a six and the other a four-cylinder model. The former is rated at 60 horsepower, the motor having dimensions of 4 1-8 inches by 5 1-4 inches and wheelbase of 133 inches. The six-cylinder chassis has a very accessible unit power plant. The motor is equipped with Bosch ignition and imported bearings are used throughout the transmission. The axle is floating and the springs are shackled, being built into the frame. The lighting equipment of this car consists of a Willard storage battery and a special form of generator. The other new model is to be known as the Popular and has a 3 3-4-inch by 5 1-4-inch motor. Like the other new creation, its power plant is made in one unit with the transmission, and the lower part of the crankcase is made easily removable, the mud pan being cast integrally.

Michigan Has Two Chassis—Three roadsters and a five-passenger touring car are the products of the Michigan concern. They are mounted on either a 33 or 40-horsepower chassis, and in either case the wheelbase is 116 inches. Demountable rims, 34-inch by 4-inch tires, self-starter and torpedo type of body are talking points for this line. In connection with the motors three-bearing crankshafts and enclosed valves are used. Nickel trimmings serve to enhance the beauty of the cars of this make.

Miller Another New Product—Another addition to the pleasure car field is the Miller car. The principal chassis features are the four-cylinder, long-stroke motor, the cylinders being cast en bloc, selective sliding transmission, cone clutch, torsion tube inclosing driveshaft, single universal joint at forward end, I-beam front axle, pressed channel-steel frame, semi-elliptic front and elliptic rear springs, front tire sizes 34 inches by 3 1-2 inches, rear 34 inches by 4 inches. A thermo-syphon cooling system is used which consists of a vertical-tube radiator and belt-driven fan. The wheelbase of the touring car is 116 inches and of the roadster 110 inches.

Norwalk Makes a Six—The Norwalk is out with two chassis types, one with a four-cylinder motor having a bore and stroke of 4 1-4 inches by 5 1-2 inches, and the other with a six-cylinder motor with bore and stroke of 4 inches by 5 inches. In the former case the cylinders are cast separately, in the latter they are cast in pairs. The six-cylinder has an underslung frame, while the four-cylinder is hung in the more conventional manner. The higher powered six-cylinder car has a wheelbase of 136 inches, while the smaller has a 124-inch wheelbase.

Otto Has Monobloc Casting—The new Otto motor is a monobloc, has a bore of 4 1-2 inches and stroke of 5 inches and it is designed to develop 31 1-2 horsepower. The crankcase is divided horizontally in two halves, the upper half containing the complete crankshaft bearings. Lubrication is accomplished by means of automatic splash system, the oil level being maintained by gear pump, while ignition is taken care of by magneto and storage battery. The clutch is of the leather-

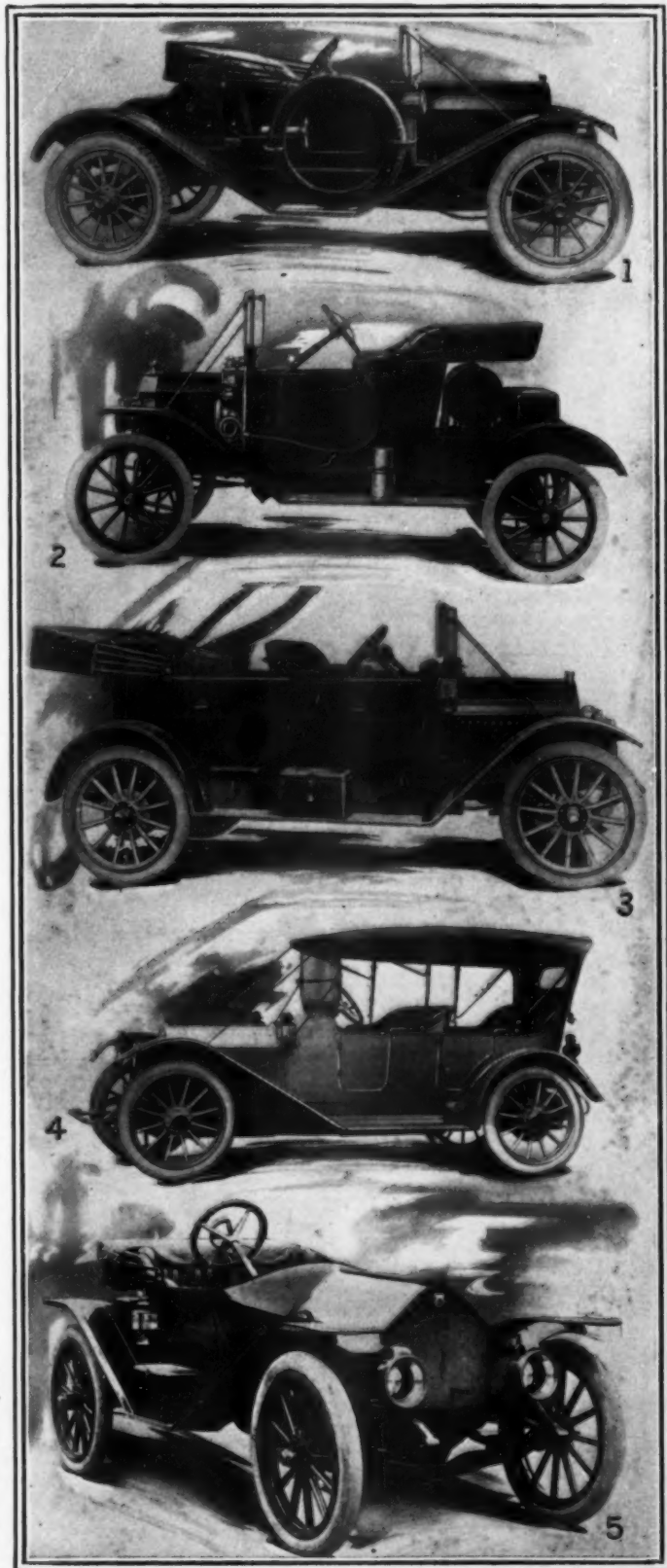
faced cone type with special spring inserts and the transmission, which is three-speed selective, connects to the straight-line shaft which is inclosed by torsion tube. The rear axle is floating, front axle of I-beam section and the wheelbase 123 inches. Several small refinements are in evidence in connection with the bodies. These include the addition of scrapers on the running boards, mats and electric lighting. The spring ends are also protected by leather covers and demountable rims form part of the equipment.

Four Models of Pratt-Elkhart—Four models for two, four, five or seven passengers are brought out this year on the Pratt cars, all of which are mounted on the one chassis. The motor used has a 4 1-2-inch bore by a 4 3-4-inch stroke. It is of the L-head type. The power plant is of unit construction, and three-point suspension is one of its features. The wheelbase this year has been increased from 117 inches to 120 inches, and the wheels have demountable rims, the size being 36 inches by 4 inches. Prest-O-Lite starter, electric lighting, inside control are among the new features. A Schebler carbureter adjustment on the dash is used, while the frame construction, the use of Bosch magneto and the form of the rear axle have not been altered. The body, however, has been enlarged. More seat room is afforded in the rear, the width being increased from 48 inches to 51 inches. Three-quarter elliptic rear springs having a length of 56 inches replaced the former ones of 51-inch length. Roadster and touring car types are manufactured.

Republic Adds Pony Tonneau—In addition to the Republic roadster and touring car a four-passenger pony tonneau model has been put on the market this year. All three are mounted on the same chassis, the motor of which remains practically unchanged. Several changes, however, have been made in the gear-shifting mechanism, rear axle and spring suspension. The control levers are securely fastened to a cross-member of the frame and the muffler cut-out is made a unit with the chassis, it being in no way attached to the body. An innovation is to be noted in the location of the battery box, which is fastened inside the frame and is made accessible by the removal of floorboards. This location has been adopted in order to preserve the clean-cut appearance of the outside of the car. The brake rods are suspended on the torque tube, the supporting yoke being placed on the same center as the radius rod end, allowing the brake rods and brake bands to move on the same center as the rear axle. As regards rear spring suspension, instead of using a casting to fasten the upper half of the spring to the frame the rear gusset plate of the frame itself has been extended. The lower half of the spring is slung under the axle and the spring pad is made with a large lip for holding the rebound straps. The engine is supported by sub-frame as well as the steering gear. In this frame the frame members are securely tied to the main frame by plates. The steering gear is mounted by a bearing on either side. The bodies have been improved to conform with the latest dictates of design.

Three Staver Chassis Now—This year sees three chassis types in this line with wheelbases of 112 inches, 120 inches and 124 inches. The motor size of the shortest model is 4 3-8 inches by 5 inches, while for the other two the bore is increased to 4 1-2 inches, the stroke remaining the same. Motors are of the T-head monobloc type and the crankshafts have three bearings. The frames of these cars have been made heavier and with a double drop. A new type of solid-forged front axle and a new construction which includes annular ball bearings is found on all wheels, and a reinforced torque tube having a U-type of fastening to the cross-member at its front end is in evidence. Whereas the brakes were internal expanding and external contracting, both have been made internal expanding this year. There is also a new transmission brake. The three-quarter elliptic rear springs have been increased from 42 to 53 inches.

Spaulding—The Spaulding 30-horsepower model will be continued, in addition to which a new 40-horsepower car which embodies a number of attractive features will be launched. The motor used in this new model has three-point suspension and is



1—Alpena runabout, fully equipped
2—Ford Model T, torpedo runabout
3—Lambert five-passenger touring car
4—Republic touring car, with top
5—Staver, Model 35R, torpedo roadster

a Rutenber, having a bore and stroke of 4 1-8 inches by 5 1-4 inches. In the new construction Timken axle and bearings are used throughout. Bosch dual magneto, demountable rims, dash adjustable, Schebler carbureter and electric lighting outfits are included in the new car equipment.

Construction of the High-Tension Coil

Explaining How it is Made and the Theory of its Action

THE induction coil, as used in automobile ignition systems and which is a familiar object on the dash of many automobiles, is of two types; the vibrating or trembler type and the non-vibrating type. This latter type is used mostly in connection with low-tension magnetos having their own distributors together with a mechanical circuit or contact-breaking device. Batteries are used with this system, the breaking of the primary circuit and distribution of the high-tension current being taken care of by the magneto, through which the battery current passes from the coil. It can also be used with batteries alone but in this case either a master vibrating coil must be used or provision made for the breaking of the primary circuit mechanically, such device usually being incorporated in a timer used in connection with a high-tension distributor. The non-vibrating coil is also used in the make-and-break ignition system, but this form has no secondary wiring or condenser. The master coil or master vibrator, as it is commonly called, is, of course, a form of vibrating coil.

The construction of coils of various manufacture differs somewhat in minor details, this being true particularly of low-tension magneto coils which are made to meet the requirements of the particular magneto with which they are to be used. The interior construction of both types in their complete form is the same and is composed of an iron core C, a primary coil P, a secondary coil S, and a condenser CO. To the vibrating coil is added the vibrating device T. The magnetos with which some non-vibrating coils are used are equipped with condensers, consequently none is necessary in the coil and this form has simply the primary and secondary windings. Other non-vibrating coils have their condensers as separate units. The master vibrator as used in connection with a multiple unit coil of either type is similar to the regular vibrating coil with the exception of the fact that it has no secondary winding. The platinum points are generally much heavier.

The primary coil which receives the low-tension current from the battery or magneto is composed of three or four layers of about No. 20 insulated wire wound directly upon the iron core which is generally made up of a number of soft iron wires, soft iron being used because it does not retain the magnetism. The secondary coil which is wound over the primary winding is composed of from 10,000 to 15,000 and sometimes even 20,000 turns of about No. 40 wire, each layer being insulated from the preceding one by paraffine paper. The condenser is a device used to absorb the primary current when the circuit is broken in order that the maximum efficiency may be obtained from the coil and it is connected electrically with the primary winding. It is composed of a number of tinfoil sheets insulated from each other by mica or paraffine paper and alternate sheets are connected to each other as shown in the illustration CO1. As it is necessary to exclude all moisture, dirt and even air from the wiring and condenser the parts are insulated from each other and all foreign matter by glue pitch, sealing wax or some similar compound which also serves to keep the different parts in position.

The trembling or vibrating device T consists essentially of a vibrating spring SP and two platinum points EE, one of which is connected either directly or indirectly to the spring, and an arrangement for adjusting the tension of the spring; to the underside of the spring directly over the core is attached a steel block, which is attracted by the core and is the medium through which the circuit is broken. The arrange-

ment of the various parts differs in coils of different manufacture.

The action of the vibrating coil may be described as follows: The low-tension current, usually from 4 1-2 to 7 volts, flows into the primary coil and a magnetic field is immediately set up which results in the magnetization of the soft iron core, the primary coil and core becoming to all intent an electro magnet. This core, which you may note protruding through a hole in the vibrator base, attracts, through the medium of the steel block, the vibrator spring, to which the lower platinum point is secured in some manner, and the primary circuit is broken. In the non-vibrating coil the flow of the primary current is interrupted or broken mechanically instead of electrically, usually by a cam arrangement either in the magneto breaker box or in a timer, the cam being secured to a rotating shaft and separating the platinum points used in the mechanical circuit breaking device, once every revolution of the shaft or oftener; the frequency depending on the shape of the cam or the form of the timer or magneto used.

While the low-tension current flows through the primary wiring a phenomenon known as induction takes place wherein a current is induced in the secondary winding. This is not due to any electrical connection between the two windings but is the result of one of the many peculiar properties of electricity. Were the two windings placed side by side in the open air with an appreciable space between them the phenomenon would occur just the same but the efficiency of the secondary coil would not be as great. The cause of the phenomenon of induction is unknown.

The current which is induced in the secondary coil is of a very high tension or voltage, averaging from 20,000 to 30,000 volts, sometimes higher, and it flows in a direction opposite to that of the primary current. When the primary circuit is broken either mechanically or electrically the high-tension current reverses its direction of flow and this reverse impulse has about twice the value in strength and efficiency of the direct or first current induced in the primary coil. If the primary current was allowed to die out slowly, which it would do if the condenser was not used, the secondary current would also spend its strength proportionately and lose a large percentage of its value; therefore the quicker the primary current is brought to a stop after the circuit is broken, the higher the efficiency of the secondary current will be. The importance of the condenser will become apparent when it is understood that its function is to instantaneously—or as nearly so as possible—absorb the primary current at the moment the circuit is broken, thus allowing the maximum value to be obtained from the secondary or induced current. Whether the condenser is incorporated in the coil, or in the magneto, or is a separate unit its action and effect are the same.

If the condenser does not work properly the primary current will die out slowly and thus lower the efficiency of the secondary current. A faulty condenser in a vibrating coil will make its condition apparent by excessive sparking at the platinum points.

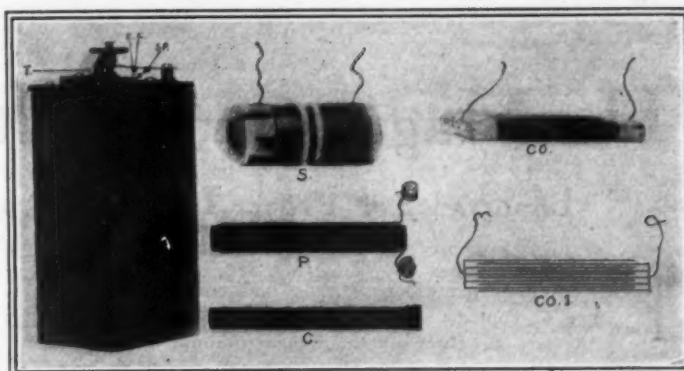
When the primary circuit is broken and the current brought to a stop by the action of the condenser, the high-tension current seeks an outlet and rushing to the spark plugs ignites the compressed gases in the cylinder by jumping the gap between the spark plug electrodes. The foregoing, of course, applies to the jump-spark ignition system.

In the make-and-break ignition system the circuit is broken by a mechanical device in the cylinder compression chamber, the separating of two contact points causing a spark in the same manner that a spark is caused by touching and separating the positive and negative wires of an ordinary dry cell. The spark occurs in both systems at the moment the primary circuit is broken and not at the making of the contact. The action of the master vibrator is the same as that of the primary winding and vibrating device in the regular vibrating coil but inasmuch as master vibrators are made to be used in connection with non-vibrating coils having their own secondary windings or with vibrating coils in which the vibrating device is made inoperative, it needs no secondary winding, that of the regular coil with which the master vibrator is used taking care of the secondary current. The advantage claimed for the master vibrator is synchronism of ignition. Literally speaking the master vibrator without a secondary winding is not an induction coil.

The action of the coil may be termed a cycle and takes place in about 1-100 part of a second, continuing as long as the circuit-closing device or timer is in contact with the particular coil or unit in which the cycle is taking place. With the non-vibrating coil the rapidity of this cycle is controlled by the speed or form of the circuit-breaking cam or other device. With the vibrating coil it can be controlled by the adjusting screw or thumb nut, bearing in mind the fact that the nearer the vibrator is to the core the more rapid the vibration.

Rapid vibration is desirable to a certain extent inasmuch as its action is surer than that of a tightly adjusted coil; however, the vibrator can be adjusted to work too rapidly inasmuch as a loose adjustment will allow the vibrator spring to be drawn down as soon as the current begins to flow in the primary coil, breaking the circuit before the primary current has reached its maximum efficiency and affecting the action of the secondary current accordingly. Again, if the vibrator is adjusted too tightly the current is liable to "arc" between the platinum points, interfering with the proper action of the coil. When properly adjusted the vibrator will give forth a distinctly musical sound which should be in the nature of a low buzz. A high note indicates too tight adjustment which will cause excessive pitting and wearing of the platinum points. Platinum is used because of its ability to withstand the action of the extremely hot high-tension current without fusing.

To adjust a vibrating coil set the vibrator loosely and turn the engine over to a point where the primary circuit is closed by the timer (or other device) which position will be indicated by the buzzing of the vibrator (of the particular unit in circuit in the case of a multiple unit coil); then turn the adjusting



Working parts of the ordinary type of high tension coil

screw or nut whichever the case may be, until the proper adjustment is secured as indicated by the tone of the buzzing. If the coil be adjusted while the motor is in operation the correct adjustment can be secured by noting the effect of the different vibrator positions on the speed or action of the motor and the point at which the motor will run with the most regularity at an average speed would indicate the proper adjustment of the coil.

In the case of a multiple unit coil it is important that all the units be adjusted as nearly alike as possible in order to obtain the maximum efficiency from the coil and the advantage of using the master vibrator with a multiple unit coil lies in the fact that there is but one vibrator to be adjusted, therefore obtaining the same efficiency from each unit. When using batteries it will be found that a coil adjusted to suit a strong battery will not work so well with a weak battery and vice versa, and it is advisable to keep the batteries in proper condition rather than to change the coil adjustment. The platinum points should be kept free from all dirt and grease and at the first sign of uneven wearing or pitting should be filed smooth and flat so that they meet squarely. For this work a fine watchmaker's file or very fine emery cloth should be used. A manicure file can also be used advantageously.

The induction coil is to all intent an electrical current transformer, the action of which changes or transforms the current from a low to a high potential. Its action can be likened to that of an ordinary reducing valve; in the one the volume of current of water (or other fluid) is decreased, and the pressure increased proportionately; in the other the amperage, which is the volume or current, is reduced and the pressure or voltage increased.

Proportional Elastic Limit and Elastic Limit

By Henry Hess, Member of the Society of Automobile Engineers

THE following paper was read by Henry Hess at the last meeting of the Society of Automobile Engineers in New York. No new facts are brought out, but it will be of interest to note the personal error which may enter elastic limit determinations. Perhaps a perusal of this will disclose the reason for the varying results obtained from standard specimens of steel.

The French Commission on Testing Materials of 1895 has given the following generally accepted definitions:

1. "The elastic limit or the uniform stress beyond which a portion of the deformation remains as a definite set."
2. "The proportional elastic limit corresponding to the point where the deformation ceases to be proportional to the loads."

Frequently the difference between these two points is not

recognized. This is due to the fact that the average testing machines and extensometers are not sufficiently sensitive to clearly show proportionality between deformation and load. Only carefully plotting the deformations to a large scale or the employment of sensitive autographic extensometers will develop the point of departure from proportionality. Taking the "drop of the beam" as an indication leads to serious error as that, even if observed correctly, occurs at a point where the specimen practically begins to actually fail. A careful observer using the dividers may possibly catch the point somewhat more closely, but never sufficiently so; at the best the personal equation enters in too largely. It is the "true elastic limit" and not the "elastic limit," as stated by omission, that should be used for safe figuring of strains and stresses. For "true" elastic limit read "proportional elastic limit" as the accepted term.

The Magneto in Relation to Engine Design*

Importance of Proper Location, Accessibility, Alignment and Wiring

THE magneto manufacturer has had considerable annoyance to combat in the past, due to the fact that many engineers have not given sufficient thought to the correct disposition of the magnetos in their original designs. Some of this is adjusting itself automatically with the advent of the long-stroke motor, due to the fact that inlet and exhaust manifolds are considerably higher than previously. But there still remains considerable room for work in this direction. These points, if considered in the first stages of motor design, will necessitate practically no additional work or cost and will certainly be of advantage to the user and in many cases to both the car and magneto manufacturer.

In considering the magneto in its relation to engine design, it might be well to make five classifications, as follows:

First: There is the consideration of the proper location of the magneto, so that it will be free from excessive dirt, grit, water, oil, heat and other engine discharges.

Second: To so locate that the main parts of the magneto are accessible and visible; also not to obstruct or interfere with the accessibility of adjacent engine parts.

Third: Accurate means of alignment with the driving mechanism—to eliminate undue wear on the universal joints, which in turn results in other disastrous strains, such as endthrust in the armature shaft, etc.

Fourth: To so locate spark advance levers that they will operate freely and smoothly, giving full advance and retard without undue strains being set up.

Fifth: Proper wiring of both primary and secondary and location of coils.

Location of Magneto.—Under the first head precaution should be taken that the magneto be so located that water or oil connections that might in time become leaky should not be close enough to cause trouble. Protection from the usual oil discharges from valve tappets and gear drive should be given. The inclosing of valve mechanism is curing much of this evil.

Care should be taken that the exhaust manifold is sufficiently clear of the distributor parts to absolutely insure their not being affected by that heat. Some magneto manufacturers are using a form of fireproof distributor for that very reason, such as Bakelite.

In motor layouts where the carbureter is on the same side as the magneto it is often situated dangerously near the magneto circuit-breaker and the distributor. This practice is to be deplored for many reasons. The carbureter flooding directly on the magneto or allowing waste gasoline to collect near the sparking apparatus is frequently the cause of dangerous fires. This is especially the case with web-supported crankcase arms. It must always be borne in mind that most magnetos are supplied with an exposed safety gap which if surrounded by a combustible mixture will immediately cause fire.

Accessibility.—Under the second head the writer would strongly urge that great care be taken by the engineer that the parts necessary to properly time the motor be easily accessible without the necessity of any unusual acrobatics on the part of the operator. This refers especially to the universal joint and the breaker box. Forms of joints which allow variable and positive means of setting are strongly recommended, and if accompanied with explicit instructions for timing will avoid the usual demounting of the gear covers to shift those usually in-

accessible parts. It is also urged that in those motors where the magneto and carbureter are on the same side sufficient room be allowed to make easy the examination of the platinum points in the breaker box without the use of mirrors and other make-shift methods. On many cars the magnetos are placed so low that it is impossible to get at these essential parts without the removal of the sodpan. In many cases to properly inspect the magneto it is necessary to entirely remove it; in such cases the car owner has been compelled to pay for many make-shift and improper adjustments or for the time expended in removing and again setting the magneto. If properly placed the adjustment would have been quickly and easily made by himself. It is therefore strongly recommended that the magneto drive be on the same plane horizontally as the crankshaft and if possible even higher, which will, of course, bring the breaker box into full view.

Alignment of Driving Mechanism.—Under the third head we come to probably one of the most prolific sources of trouble: due to either improperly designed joints or improper machining of the magneto base, or both. To this is due largely the noise in the magneto and magneto gears, also the eventual breaking down of the bearings supporting the armature shaft, especially in ball-bearing magnetos. The ordinary type of Oldham coupling in which the female member has become worn tends to create endthrust in the magneto bearings which they were never designed to absorb. So great care should be taken in machining the magneto base-plate to the exact height and then furnishing rigid means of securing the magneto and seeing that the joint used is one that under a little wear will not tend to create undue endthrust. The writer would strongly urge that all universal joint parts be carefully hardened and that the material used be one which will take a good coat of case-hardening.

General Design of Base.—Under this head it might be well to call attention to the general base design. Manufacturers employing cast-iron crankcases are strongly urged to make the magneto base up separately from the engine base and use a non-magnetic metal in its construction. Experiments have shown that with certain magnetos the use of a magnetic metal in the engine base has caused a loss of as much as 7 per cent. in the magneto flux, which in turn affects the total efficiency of the magneto and more glaringly in slow speed operation. The base should be designed to be rigidly supported and properly webbed to avoid vibration.

Locating Spark Advance Levers.—The fourth consideration is purely a case of mechanics. Many designers leave this matter in the hands of inexperienced men, with the result that the breaker box is often subjected to strains it was not intended for. Levers are often inadequate for the work in hand; proper regard is not paid to the levers, and often only a small part of the quadrant is used, and owing to an entire disregard of the law of the lever it is a matter of some inconvenience to advance and retard the breaker box.

Particular attention should be paid to the method of rotating the cam house, for, if the force is not applied in approximately the same plane as the cam house bearings, there is a decided tendency toward undue sticking and consequent wear. In order to avoid cramping and stiff working of the control mechanism properly designed cranks and clevises and ball knuckle joints are advised. If possible the control mechanism should be so arranged as to be easily taken down. Split pins are very easy to put in but often difficult to get out.

*Paper read at the annual meeting of the Society of Automobile Engineers by F. E. Moskovics, Member of the Society.

Wiring Location.—Too little attention has been paid to the extremely important matter of wiring. On the modern car the high tension circuits are usually well placed, due to the fact that trouble in them is so self-evident and develops so early. The art has progressed to such a point that probably any suggestions on the disposition of the secondary wiring would be superfluous. But it is to be urged that it is equally important to carefully segregate and insulate the primary wires if for no other reason than the fact that it takes a long time for them to give trouble, but when they do it is one of the most annoying things to locate in the motor car. They should be located in such a position that they will be free from oil and gasoline drippings and the heat of the exhaust manifold and that vibration of different parts will not tend to chafe or wear them. It is also suggested that where the primary wires leaves a rigid part, such as the dash, a sufficient length should be left slightly coiled to fully compensate for any motion between these parts. With the advent of the acetylene and other starting devices of the internal combustion type the matter of the location of the secondary coil again becomes a subject of some import. Practically all ignition manufacturers supply weatherproof coils, but all are not heat-proof or oil-proof. Therefore it is suggested

that it would be good practice to so locate the coil that the heat of the motor will not affect it any more than is absolutely necessary and also that it be free from the oils, water, gasoline and other engine discharges. This will add considerably to the life of the ignition system.

Conclusion.—In closing it is safe to say that the magneto has arrived at a very high state of perfection, due mainly to careful specialization. Considering the work in hand, the instrument gives but little trouble and with the few points indicated carefully watched the lot of the car owner will be made perhaps a little easier and the instrument itself will repay in longer life the slight expenditure of time necessary to accomplish these things. The manufacturer will also be well repaid now that car upkeep has become a considerable factor in his sales arguments. Many motors seem to be very carefully designed in all details except the magneto, which when installed appears entirely as an afterthought. Now that the magneto has become a permanent part of the motor it is felt that with these few suggestions the magneto manufacturer and the automobile manufacturer can probably work to a little better purpose and in combining their efforts work toward making the lot of the owner and repairman somewhat less complex.

The Aluminum Industry

Its Rapid Growth Due in Part to Automobile

THE 1910 output of bauxite in the United States was 148,932 long tons, valued at \$716,258. The average price at the mines has been: 1908, \$5.06; 1909, \$5.26; 1910, \$4.81. Bauxite is principally used in the production of metallic aluminum and in the manufacture of the artificial abrasive, alundum, at Niagara Falls. This abrasive is made in the electric furnace by fusing calcined bauxite. Experiments are also being made in admixing bauxite with other materials for making refractory brick, which for linings far exceeds the life of silica or fire-clay bricks.

The world's production of bauxite in 1909 totaled 270,581 tons, valued at \$949,924, of which the American share was 129,101 tons worth \$679,447. The French output was 128,099 tons worth \$251,188.

The growth and magnitude of the aluminum industry of the United States are shown in the fact that only 83 pounds were produced in 1883, 3,000 pounds in 1886, 4,000,000 pounds in 1897, 17,211,000 pounds in 1907, 34,210,000 pounds in 1909, and 47,734,000 pounds in 1910. The American exports of aluminum and its manufactures increased from \$364,521 in 1906 to \$949,215 in 1910.

At the beginning of 1910 aluminum was worth 20 to 23 cents per pound for ingot metal, closing the year at 22 1-2 cents for No. 1 ingots, with the market on the decline.

Under the Payne-Aldrich tariff act of August, 1909, aluminum, aluminum scrap, and alloys of any kind in which aluminum is the component material of chief value, in crude form, are dutiable at 7 cents per pound, and plates, sheets, bars and rods at 11 cents per pound instead of 8 cents and 13 cents, respectively.

The president of the Aluminum Company of America, stated that business in 1910 fell off on account of curtailed production in steel making, in which it is used for deoxidizing. "Large stocks accumulated and are still accumulating. Some plants have been cut back half and unless the demand improves still further cutting back will be necessary. The aluminum cooking-utensil business was good. Although a new (aluminum) sheet-rolling mill was built in Niagara Falls in 1910, it was not put into operation, on account of the falling off in business, but, as it was built to meet future requirements, it is expected that the time will come when the mill will be required."

Preventing Horn Abuse

Disconnect a Battery Wire and Save Current

WITH the large number of electric alarm signals now fitted to cars it is not surprising that juveniles find great delight in locating the button which operates such signals and creating a pandemonium in the owner's absence. If they were satisfied with a short signal by way of a little fun, things would not be so bad, but when a band of a half-dozen holds a meeting and competes among themselves as to who can make it operate the longest, the vicinity becomes unbearable. These signals are usually provided with what are termed instantaneous push on connections and if owners were to remove one of the wires and thus render the button-pressing futile, much nerve racking sound would be stopped. It is a dangerous practice to chastise other people's children as the act is liable to bring a tempest about one's ears, which is by no means to be desired.

Working Chrome-Nickel Steel

A process for obtaining a hardened surface without case-hardening and without impairing the cohesion and elasticity in any part has been patented in Germany and France by the military Forge & Steel Works at Saint Chamond, France, with special reference to armor plate and ordnance. The steel under consideration holds 65 to 80 points of carbon, 3 to 4 per cent. of chromium and 2 1-2 per cent. of nickel. The treatment is as follows: Before being machined into the desired shape, the steel is heated to a temperature decidedly higher (about 850 degrees C. to 900 degrees C.) than the critical temperature of the alloy and then—presumably after cooling—to a temperature only slightly higher (about 775 degrees) than the critical one.

After being machined, the article is heated to 775 degrees again and is quenched in oil. Then it is reheated to the same temperature and allowed to cool. Thereafter it is heated to a point slightly below (about 650 degrees to 674 degrees) the critical temperature and quenched in water, to obtain a fibrous texture.

Now the article is heated unequally; that is, so that the surface to be hardened rises to 800 degrees to 850 degrees—well above the critical point of the alloy—while the rest remains below this point—and it is then quenched in water.—From *La Technique Moderne*, January 1.

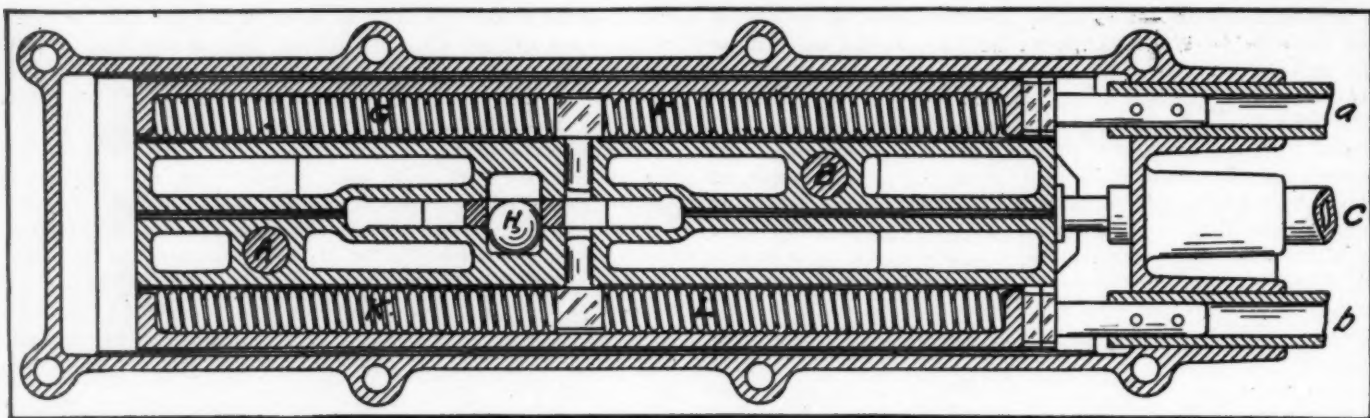


Fig. 1—Horizontal section through the new automatic transmission controller showing control

New Automatic Transmission Controller

A Device Specially Adapted for Use on Commercial Vehicles

FOR years it has been the endeavor of the commercial car designer to meet the constant demand of motor truck users for the production of a machine which would be foolproof and one which would eliminate the necessity of employing skilled operators. One of the parts of the gasoline car which has suffered most in the hands of careless and unskilled drivers is the change-speed mechanism, especially where it is of the sliding type. This is one of the sales points in favor of the electrically operated motor truck of today.

With the idea of eliminating a number of these difficulties,

Hollister & Waerner, New York City, have brought out a new transmission-controlling device for commercial vehicles, which, both in regard to construction and operation, possesses many novel features.

The accompanying illustrations show the design of the mechanism, which is claimed to be certain in its mechanical operation and which is said to be operated equally well by the novice or by the experienced driver.

The operating lever is placed either on the steering wheel or on the side of the car, as in the more conventional way. It

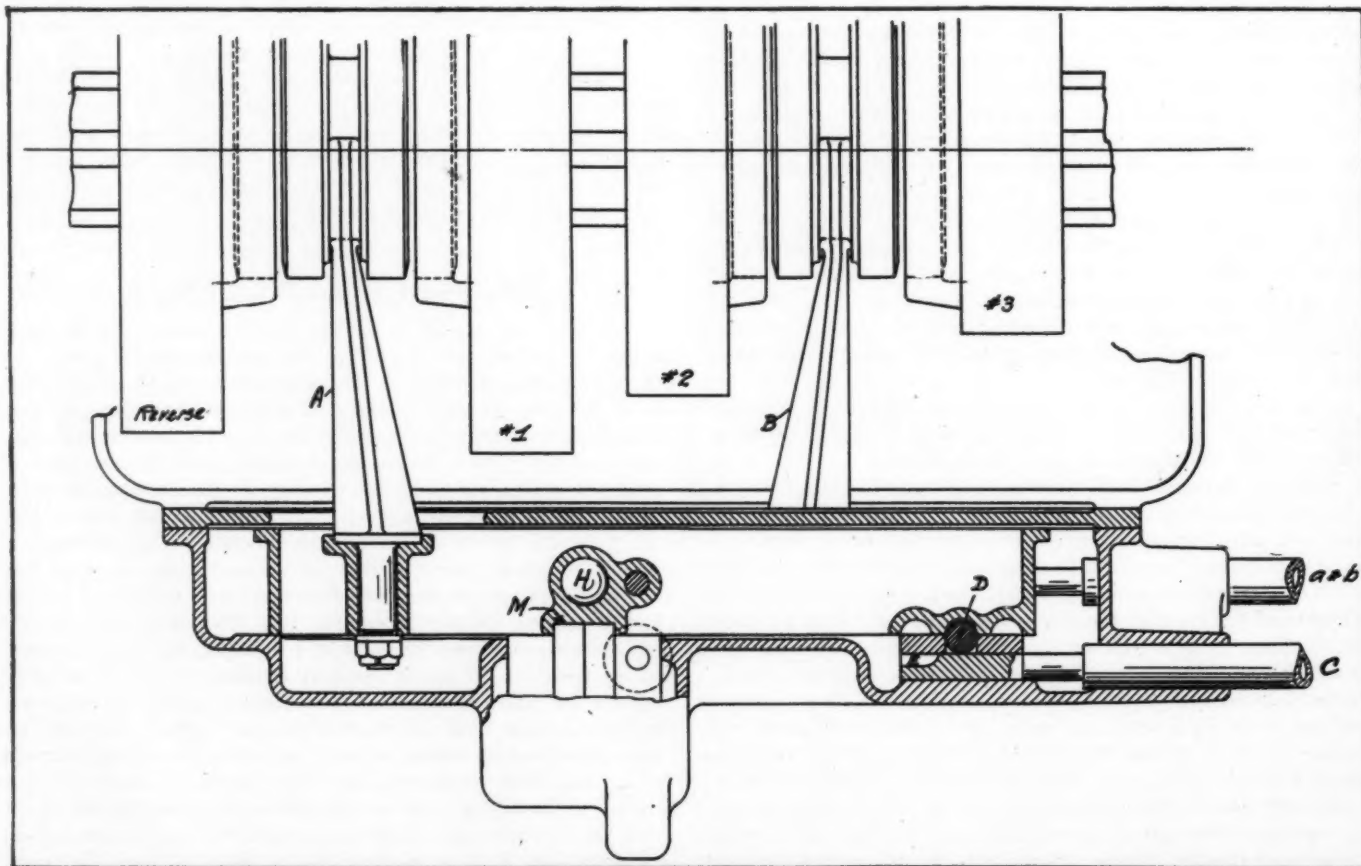


Fig. 2—Sectional elevation of the controller showing the positions of the change-speed rods

can be moved forward or backward without disturbing the gears, as the speed change occurs only when the clutch is released. Any speed may be obtained at the will of the driver without going through or disturbing any other gear except the one which is to be used. A cam attached to the steering gear or control device may be used to control it in a progressive manner if desired, or the ordinary form of gearshift may be used by connecting direct to the transmission-control device.

The new control is designed for use on either the light delivery wagon or the heavy truck.

The operation is as follows: By pulling or pushing on rods a or b, the springs G, F, K or L, Fig. 1, are either compressed or released. The rods and springs being interconnected, compression of one set of springs releases the other set, and vice versa. When pulling the lever C, however, the ball H drops into the clearance space E, allowing the speed-change rod A or B to move in the direction given it by whichever spring is in compression and thus putting the burden of shifting to the desired gear on the spring. As lever C is connected to the clutch, the rods A and B cannot be operated until it is released. The ball H is provided so that only one speed-change rod can move at a time, thereby preventing the locking of the mechanism.

The pulling or pushing of rods a or b, Fig. 2, from the neutral position to either of the end positions pushes the interlocker trip finger guide down, thus preventing the speed-change rods from stopping in the neutral position when going from reverse into speed number 2 or from number 1 to number 3, or vice versa. When it is desired to place these rods in the neutral position, rods a or b are put in their middle position, thus allowing the interlocker trip finger to also assume its middle position. This

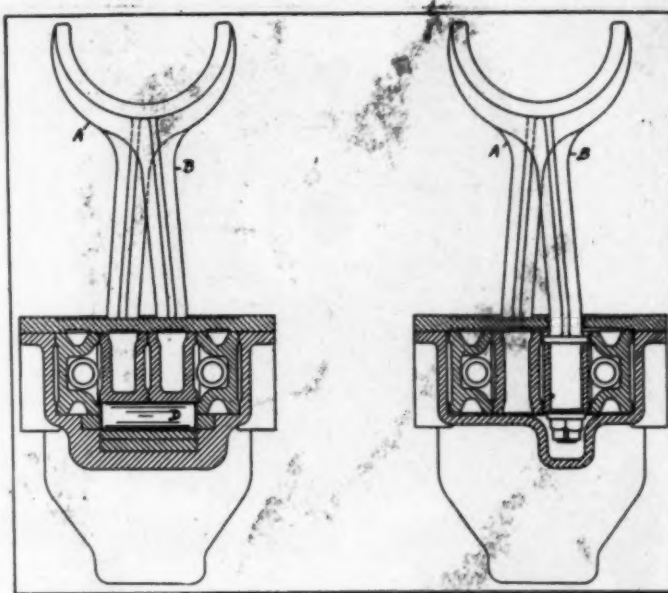


Fig. 3—Transverse section through the new change-speed device

action stops the speed-change rods A and B in the neutral position, the interlocker trip finger checking them in the slot M.

Two interlocker trip fingers are used so as to prevent these rods A and B from passing by, one trip finger after the other dropping into the slot M.

Harking Back a Decade

FROM the *Motor Review*, January 30, 1902:

Suit has been brought against Stanley Brothers of Newton, Mass., on behalf of the Whitney Motor Wagon Company to prevent the Stanleys from manufacturing steam vehicles, which, it is alleged, infringe patents owned by the complainants. Whitney's original steam vehicle was built in 1896 and a later wagon was shown at Mechanics' Hall during the winter of 1897-1898.

J. H. Flagler, president of the Automobile Company of America, a \$4,000,000 concern about which rumors have been spread recently aimed at its credit, declares that the company stands ready to pay all claimants as soon as their accounts are verified.

The assets of the Baldwin Automobile Manufacturing Company, of Connellsville, Pa., amount to \$100,298 and liabilities to \$98,605. The cash on hand is less than \$100.

Sales of Oldsmobiles in New York City average one each day, according to reports made by the factory. This year the Oldsmobile will be equipped with a brake on the differential case. Heretofore the local agent has been obliged to furnish hand-brakes.

F. B. Stearns was married last week to Miss Florence Wilson, of Cleveland. Mr. Stearns says that on his return from his honeymoon in February his first act will be to have plans prepared to double the turnout of the factory.

Senator William A. Clark, of Montana, has just received the biggest automobile ever seen in Washington. The car is of 24 horsepower and looks like a gasoline car, but is run by steam. It is 13 feet long and cost \$8,000.

Asheville, N. C., the great winter resort for persons suffering from incipient tuberculosis, is to have another element in therapeutics introduced in the shape of a couple of open automobiles. The physicians of the local sanitarium declare that riding in the open air will do the sufferers a world of good.

Indications point to a splendid turnout for the second annual endurance run of the Long Island Automobile Club. As in 1901, each contestant will be supplied with a blueprint showing the course from start to finish.

The affiliation scheme has been resting during the past week, as far as the L. I. A. C. is concerned. It is hoped that the A. C. A. will call a convention to take up the matter jointly.

The Cocks bill making it a misdemeanor to drive faster than 15 miles an hour in the country or 8 miles an hour in the city may be amended to make 20 miles an hour the limit of speed.

The great change in ideas indicated by the Madison Square Garden show of 1901 as compared with that of the previous year has been generally commented on; the majority of the vehicles exhibited in 1900 were distinctively shaftless carriages of the standard American design, differing as little as possible from the horse-drawn vehicles, while in the later show the majority were practically highway engines patterned very closely after the French type.—*Editorial*.

Precaution for Frame Welders

The inspector of industrial plants in France recommends that in all establishments for autogenous welding a hydraulic valve for preventing the return of gas from the torch or burner to the acetylene gas generator be adopted as a compulsory feature, and the Central Office of Acetylene Users has recommended to its patrons to take this precaution voluntarily. The Board of Health for the Department of the Seine (city of Paris) at its session on June 2, 1911, recognized the special merit of a hydraulic valve for the purpose in view, but, in accordance with its policy of avoiding mandatory restrictions, limited itself to recommending that suitable means should be adopted to prevent the return of gas to the generator.—From *La Technique Moderne*, December.

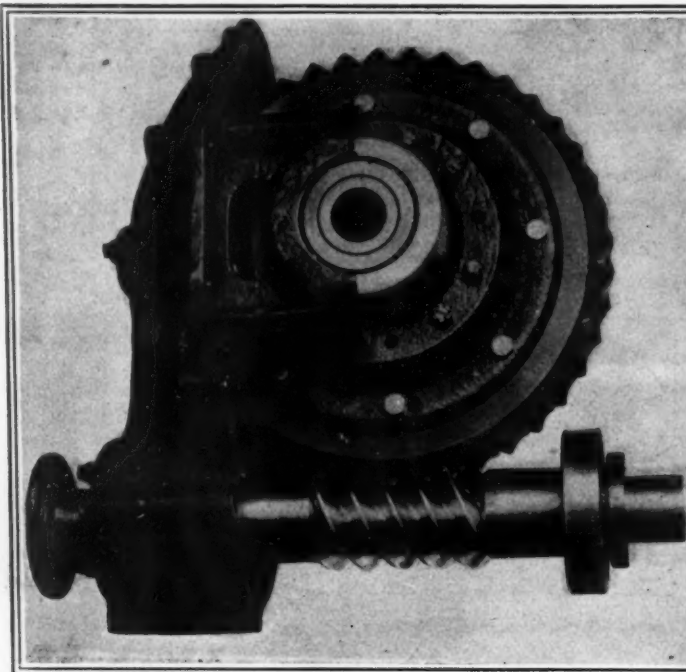


Fig. 1.—Worm gear shown assembled in end cap

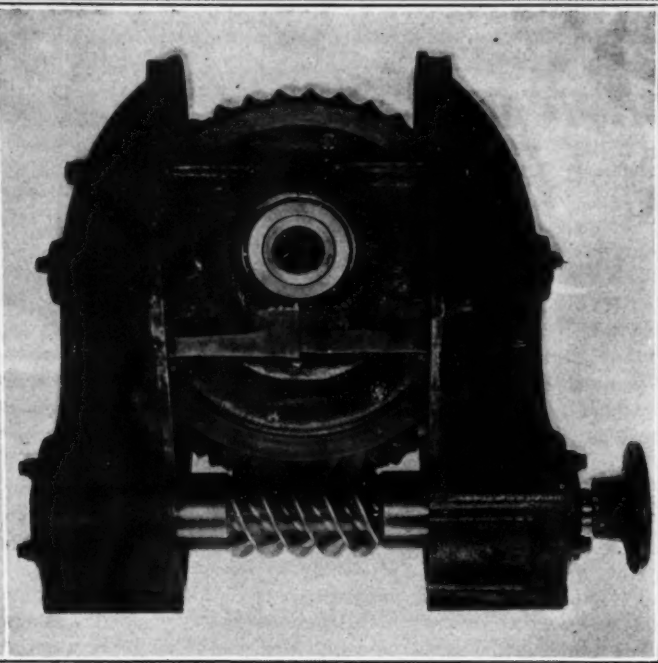


Fig. 2.—Worm gear shown in one axle housing end cap

Worm-and-Gear Final Drive for Trucks^{*}

Developing a Design; Cost and Durability of the System

NUMEROUS discussions of worm-gear type of drive and its application to motor vehicles have taken place, but the various arguments have not materially changed the status of the problem. There has been no thorough research the result of which, if disclosed, would throw light on the subject and clear the haze of mystery now surrounding it.

Final Drive for Heavy Trucks—Bevel gear can be applied only when ratios up to five to one are sufficient; for ratios in excess of this the dimensions of the ring gear make it prohibitive, as the road clearances would be seriously interfered with. Assuming, for example, that an eight-to-one reduction is required, the standard bevel-gear axle with a four-to-one reduction may be used, supplementing it with a two-to-one reduction between axle and transmission. This arrangement gives the desired ratio and proper road clearance, but has the disadvantage of a double torque load in the bevel-gear construction, an undesirable condition difficult to provide for, and the power efficiency delivered at the wheels is less, due to the supplementary reduction. In the side chain and internal-gear drive similar conditions are obvious, both embodying reductions carrying in their construction a multiplicity of parts and bearings, tending to reduced efficiency, and being productive of objectionable noises and increased wear. The worm and gear from a mechanical standpoint overcome the objections cited, having a single reduction and only five bearings, under load, and, if properly designed, should be superior in efficiency. The absence of complications in the process of manufacture, simplicity of alignment and assembly are self-evident.

Developing a Successful Design—Consideration of these several features leads to a single conclusion, viz., that the worm gear is the most logical means of reduction, especially for truck construction. Convinced that this was the correct principle, it was embodied in the design of a solid-tired car, employing a

ratio of seven-to-one. A worm and gear were made and tested with unsatisfactory results; others were substituted, procured from makers specializing in work of this character. The results were the same. The termination of various attempts in failure was fully discussed with friends who essayed to discourage any further efforts. It was therefore decided to maintain a strict silence regarding the experiments until a successful design was developed.

Immediately a series of experiments was started for the purpose of eliminating the doubtful factors. This comprised a systematic testing of various metals, diameters of gears, shape and size of teeth, location and kind of bearings. Special care was exercised to obtain accurate results, which were recorded.

The conclusions, as summarized, were as follows:

Material: for worm, semi-hard steel, fine texture ground and polished. Bronze gear burnished. Floating worm support. Rigid wheel support. Thrust bearing back of annular bearings. Straight side shapes of tooth. Several gears constructed in accordance with these data showed improvement in running efficiency, but the starting efficiency was low, due to improper lead angle. The most serious trouble was stripping the bronze gear teeth. It was, therefore, imperative to find an alloy capable of sustaining excessive pressure. In 1907 the author succeeded in producing a metal possessing these qualities; employing a high-grade phosphor bronze and adding a certain percentage of magnesium. The results were marvelous. A gear of this material showed double the strength of the metal previously used. It is susceptible to such a degree of hardening that it is exceedingly difficult to file, permitting the taking of a high polish and, therefore, requiring less lubrication. The maker of the metal will guarantee a tensile strength from 105,000 to 110,000 pounds per square inch.

This troublesome obstacle surmounted, attention was then directed to the various phases of pitch and lead angles in tooth formation, as they are prime factors determining the starting

^{*}Paper read at the annual meeting of the Society of Automobile Engineers by Ralph H. Rosenberg, Member of the Society.

efficiency. Ratios, lead and tooth angles were continuously modified, until satisfactory conclusions were reached, establishing a formula giving uniform results for ratios over five-to-one. The contention is that, first, the tooth angle and angle of lead or advance must coincide, and, second, that the advance angle fixes the diameter of the worm. It is determined by extending the lines describing the flanks of the teeth to points where the intervening distance is equal to the lineal pitch times the number of leads; the distance from these points to the pitch circle of the gear is the diameter of the worm.

The following method has been adopted for determining the width of the gear and face of the teeth. They are described by diverging lines from the center of the worm including an angle of 120 degrees.

Gears made according to this formula will permit a reasonable amount of variation between the pitch circle of the worm and pitch circle of the gear, the surfaces remaining complementary. Proper relation of axes, however, must be maintained.

Cost—It has been asserted by those conceding the utility and desirability of the worm gear that it was an expensive device. Upon what grounds this assumption was made and what particular items entered into the consideration of cost were not made clear, so it was concluded that the cost of manufacture information, while not as vague as that relative to designing, was nevertheless indefinite. In E. R. Whitney's paper of June, 1911, relative to the cost of worm-gear construction, he states the worm-gear drive is not a cheap device, and that the indicated efficiency and durability results cannot be expected unless the gears are properly designed, constructed of the best materials and accurately mounted on high-grade anti-friction bearings. This statement is conceded to cover the essential facts generally, but on the question of cost the author takes issue, believing the worm gear to be the cheapest form of final drive. It is admittedly true that proper design is essential to the success of any mechanism, but it does not follow that proper design will entail any expense over and above improper design, so far as it relates to the cost of manufacture. Materials used in the worm and gear are not more expensive than those employed in the bevel-gear drive or the side-chain drive, where double reductions are used. Furthermore, a distinction should be made between experimental work and work of actual production where the facilities are provided for executing large quantities. In substantiation of my statement the following data taken from records covering

the cost of producing a worm and gear for a 5-ton truck are given.

Steel for worm.....	\$9.00
Bronze ring gear blank.....	\$18.00
Timed machine worm.....	2 hours.
Labor on worm rough turning...	2 hours.
Milling	2 hours.
Grinding	3 hours.
Ring gear turning.....	3 hours.
Cutting	1 hour and 10 minutes.

The parts were then in condition for assembling.

Durability—Concerning the durability of the worm gear, the author is in accord with Mr. Whitney; he has inspected gears after they have run 120,000 miles and found them in excellent condition. Granting that the expense of production is higher, it is offset by the greater life of the gear.

Reproducing Drawings

In a communication to the Society of Civil Engineers of France, under date of November 17, H. Claude relates the results of some experiments for devising new methods for the rapid and inexpensive reproduction of factory drawings in black or in colors. The process he devised is based on the property which ferrous gelatine possesses of retaining a fatty ink under the action of a ferro paper at all points where the latter has not been insulated. Even with a haphazard installation, transfers may be made on all kinds of paper, white, buff, onion skin; also on white calico or tracing cloth, all in a few minutes. To this end, the prepared gelatine, after being first melted in a wet-bath, is run out over a sheet of ordinary zinc. After cooling, a sheet of ferro paper, not washed, is spread over this, simply with the hand. Then a roller with ink of the desired color is passed over the paper, and the drawing immediately appears. A sheet of the kind of paper on which the drawing is wanted is simply placed on top, and hand pressure is sufficient for obtaining the imprint. The blueprint is again inked, another copy is taken, and so on. When a sufficient number is obtained, the gelatine is scraped off and remelted to be ready for another job. Two men can produce from 50 to 100 square meters of drawings per day, and the results are comparable to zinc etchings.—From *Le Génie Civil*, December 2.



Fig. 3.—Front axle with worm-gear housing

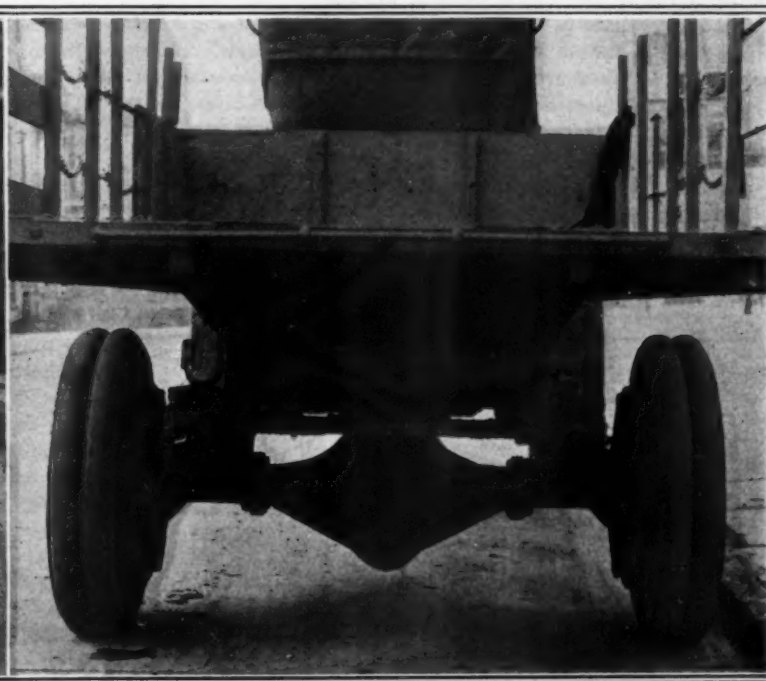


Fig. 4.—Rear axle with worm-gear housing

Digest of the Leading Foreign Journals

Touching on Flame-Welding, Quick Testing for Dynamic Strength, a Welding Contest and a New Radiator

ADVICE ON FLAME-WELDING.—Hammering of an autogenous weld is an excellent method for improving the mechanical properties of the auxiliary weld metal, provided the hammering is done at a suitable temperature. It also forces the fused metal to points which it may not have reached before and causes an intimate union with the faces of the chamfer edges. It reduces the size of the crystals or grain of all the metal which has been subjected to high heat and thereby renders it less brittle. But, on the other hand, a maladroit hammering is disastrous, causing fissures in the weld line which are liable to open up at the first shock or unforeseen static strain. Contrary to a rather widespread shop opinion, hammering is incapable of transforming a poor weld into a perfect union. An oxidized or burned weld is often ruined completely by hammering, and even a good weld is liable to show cracks or checks after a hammering done at too low temperature. And, under all circumstances, if there is an incipient fracture at the lower edge of the chamfer, the hammer blows may open it up, reducing the thickness of the metal in the joint.

The metal which has been fused under the torch usually contains grains of oxide scattered in the metallic mass, and if moreover, as is often the case, the auxiliary metal is impure with an excess of phosphorus, the grains of the metal will be found separated by whole layers of oxide which weaken it and render it hotshort. Such a weld should never be hammered without first reheating the weld to above the red heat at which it is most brittle. At a higher temperature, on the other hand, the hammering will to a certain extent drive the impurities out. Phosphorus alone makes the metal coldshort rather than redshort. Therefore, if oxidation has not been noticed during the progress of the welding, the hammering can be continued from yellow to red, but must not go below 500 degrees C., which is about the point at which color begins to show. If hammering is continued at this heat and a fracture or crack is produced, as is likely to be the case with iron or the softest grades of steel, an examination will show that the crack follows aggregations of oxide.

The practice of hammering the weld during the progress of the welding is not to be recommended, as the last welded portions are much hotter than those which have had time to cool. It is difficult to grade the blow to the varying softness of the metal. The effects will vary, and, if no deformation takes place

in cooling, internal strains are liable to be set up which will crop out afterwards.

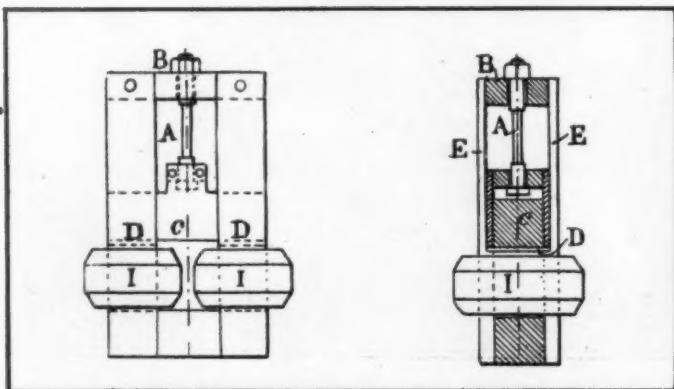
A complete annealing at cherry red of the pieces along which the weld seam runs is the best preparation for hammering, as it reduces the grain and thus obviates the spreading of fissures. As a rule, the thin welds are least liable to oxidation and may therefore be hammered with greatest safety. [Other authorities say thin welds are most liable to retain oxides by reason of their more rapid cooling.—Ed.] In case of doubt it is better to forego the delicate operation of hammering and be content with annealing the welded piece at 950 degrees C. This in itself, as may be readily perceived, refines the grain and increases the ductility of the metal.

The precaution of purifying the acetylene gas used for autogenous welding is one not sufficiently practised in the shops, although the same gas when used for illumination is nearly always first purged of its impurities. As this gas comes from a generator it is far from pure. An extremely fine lime powder, which no washing will remove, is suspended in the gas, and there is also always a little ammoniac, some sulphuretted hydrogen and especially some phosphoretted hydrogen. The inconveniences which may arise from the presence of these impurities, even though their percentage in the gas is very minute, are sometimes considerable. The lime powder settles in the ducts and nozzles of the torches, clogging them and changing the proper proportions of acetylene and oxygen, and the portion which is carried into the flame acts on the fused metal and may become incorporated in it, weakening the weld.

All acetylene gas contains the phosphoretted and sulphuretted hydrogen, and the influence of the sulphur and the phosphorus upon the weld joint is very real, as both these substances are carried into the metal in considerable proportions, especially if the welding is done too slowly. The means adopted for obviating this trouble have so far been too costly and complicated. It is necessary to count upon using 3 kilograms of "Heratol" for each 100 kilograms of carbide, which raises the price of the latter 4 francs. And the rate at which the acetylene passes through this substance has to be regulated according to the capacity of the torch. Some new purifying compounds promise better, in that they may be used five times over if they are cleansed each time by exposure to the atmosphere.—From *Revue de la Soudure Autogène*, December.

Quick Testing for Dynamic Strength.—The testing of steels or other metals for alternating and repetition stresses, which is a necessity in the automobile industry, consumes considerable time, partly because the simple rotary test of a loaded bar is not in itself conclusive and partly because the number of successive applications of power which is required for a test reaches into the millions, unless the stresses brought to bear on the test pieces are chosen so high as to nullify the significance of the recorded results through the introduction of factors, such as excessive flexion, which have no counterpart in the practical use of the material.

An apparatus which will save much time in tests of this kind has been designed by Mr. Kapp, a German engineer, and is described in detail by Mr. Perlewitz in *Zeitschrift des Vereines Deutscher Ingenieure* for August 26. It renders it practicable to subject a test piece of standard dimensions to about one million successive applications of stress in three hours, and may be



Side view and section of Kapp device for rapid dynamic tests

modified for use with other shapes and dimensions of the test material. The illustration shows side view and section of the apparatus as applied to a tensile test of a standard test piece. The test piece A is secured in two yokes, of which one forms part of the fixed cross member B and the other of the armature C of an electromagnet actuated from the coils I. The armature C is separated from the laminated pole-pieces of the magnet by an adjustable keeper D, and the cross member B is rendered integral with the magnetic field by means of four strong bars E made of rolled copper. If an alternating current is passed through the coils I, the magnetic pull produced between the field and the armature puts a tensile stress on the test piece, with a frequency exactly corresponding to the frequency in the reversal of the current. With the current ordinarily supplied in the industries, the test stress will thus be applied 50 times per second.

(As dynamic tests are kept within the elastic limits of the material, so far as the magnitude of each stress is concerned, there is perhaps no necessity for suiting the mechanism to any stretch in the test piece as the trial proceeds.)

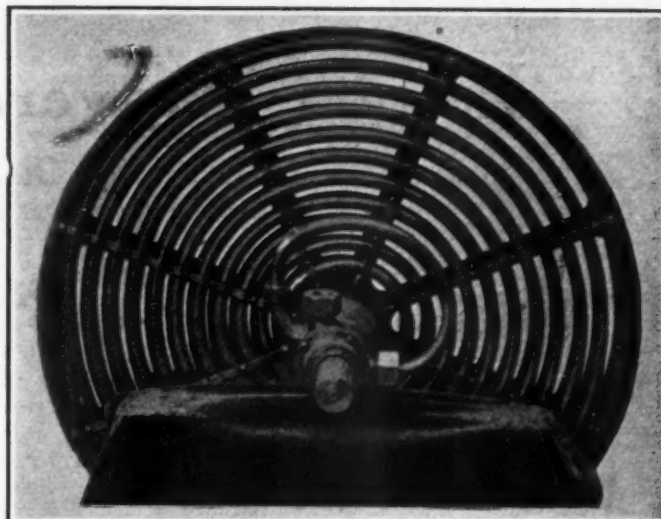
The apparatus may be applied equally well to bending and torsion tests, and to alternating as well as to simply repeated stresses. —From *Le Génie Civil*, November 11.

Results of a Welding Contest—At a recent contest in oxy-acetylene welding held in France with upward of a half-hundred entries under the auspices of the Union de la Soudure Autogène, the job given all the contestants was the welding-up of a cylindrical tank, 700 millimeters (37 inches) long and 120 millimeters (6 1/3 inches) in diameter, from soft steel plate 3 millimeters thick. The work comprised the welding of a straight side seam and joining the cylinder to the bottoms which were of heavier plate. The engineer of the "Union" gave, on the occasion of the distribution of awards, a lengthy analysis of the lessons taught by the contest, and from his explanations, which were received with great interest, the following points are summarized.

Working on a thickness of 3 millimeters a torch giving an hourly maximum feed of 350 liters of acetylene does the best work in the shortest time at the maximum feed. All the winners, and in all 43 of the contestants, used torches of this capacity. Those who used smaller ones proved slow at the work or else "burned" the metal, that is, the welds were found rich in ferric oxides and weak under the test pressure which was applied to all the work. One who used a torch of much greater capacity (500 liters per hour) took longer time and used more gas than necessary. So as not to burn through the metal, he was compelled to hold his tool very slantingly, and the fused metal was chased before the tool, piling itself up along the weld line without forming a true seam until after it had been once solidified and the torch nozzle was for the second time passed over it, producing a second fusion. Those who changed torch for the welding of the heavier bottoms lost time and gas, partly because it took time to make the change and partly, it was thought, because the heat of a flame is more effectively applied when following a curved than a straight line, so that a larger torch was unnecessary. It is common experience that a curved weld progresses 30 per cent. faster than a straight one.

All who used a higher pressure on their oxygen than about 1 kilogram per square centimeter, with torches of the capacity mentioned, wasted both oxygen and acetylene.

Certain torch constructions became overheated repeatedly. One worker had to plunge his torch into cold water 11 times, but its curved nozzle was very short, bringing the gas conduit very close to the hot weld, under which circumstances the acetylene escapes excessively and the jet becomes thread-shaped. Most of the welders cooled their torches at opportune moments to get the gas mixture right. In seven different makes of torches the proportion of oxygen and acetylene used was as follows: 1.14, 1.24, 1.60, 1.20, 1.47, 1.55, and 1.12. Some contestants, however, obtained less favorable figures, as they were careless about the gas consumption and left their oxygen under



A Flywheel-Fan-Pump-Radiator Combination

discharge while preparing the cylinder bottoms for welding. Others, when regulating their torches, allowed a small, smoky acetylene flame to scatter lampblack in the atmosphere.

It may be assumed that the average consumption of oxygen for a torch using 350 liters of acetylene per hour should not exceed 440 liters.

Weld metal was supplied to all contestants. Two of them made no use of it and made very good time with the job, but their welds were very weak. Others spread it over the weld line thickly but were not among the winners. The cylinder which endured the greatest test pressure—200 kilograms per square centimeter—presented a slight additional thickness at the seam, a quantity of weld metal having been used corresponding to the unavoidable waste in the process.

The good welders joined 70 centimeters of straight seam in 10 minutes, and those who dawdled over the work did not obtain any increase of strength corresponding to the excess of time spent over it.

The brittleness of the metal in the autogenous welding seam can be effectively removed by annealing. All the seams which were microscopically examined showed traces of oxidation, the oxides being in excess where defective welding methods had been used. The most prolific cause of such formation of oxides is the bad habit of workmen to allow the end of the nozzle to touch and sink into the fused metal.

"A weld," the engineer of the "Union" concludes, "is not a true weld unless followed by annealing."—From *Revue de la Soudure Autogène*, November.

Four-in-One Radiator—Those anxious for ideas tending to the reduction to a minimum of the parts in an automobile may receive an inspiration from the accompanying illustration representing a combined radiator and flywheel, and also dispensing with fan and water pump—which was exhibited at the recent aviation show in Paris in connection with the Fiorini 100-horsepower engine. In the absence of definite information with regard to the exact construction of this interesting innovation, it may perhaps be supposed that the front end of the motor shaft is either geared to the radiator shaft or that there is mounted upon it a stationary watertight sleeve through which the water connections with the motor may be effected. No doubt, the rotation of the radiator may by the exercise of some ingenuity be made to circulate the water. The very friction of the water against the tube walls might be harnessed for this purpose, or centrifugality might be induced to take effect more strongly on the incoming fluid than on that which returns. In the form shown in the illustration, the device seems, however, to be little more than a germinating idea dressed up to impress the beholder. —Illustration from *Der Motorwagen*, December 31.

Letters Answered and Discussed

Information on Gear Ratio, Gasoline Gauge and Motor Scavenging

Which Runs Faster

EDITOR THE AUTOMOBILE:
[3,006]—Would you please answer the following in an early issue of THE AUTOMOBILE: If two automobiles, one with a 4 by 4 motor and the other with a 4 by 6, were running on the road at 30 miles per hour, both being of the four-cylinder type and geared at 3 1-2 to 1 with motors timed and the timing gear the same, which motor would be running the faster and would there be any difference in the speeds of the pistons and of the crankshafts? If so which would run the faster?

A SUBSCRIBER.

Forest City, Ill.

The crankshafts would be turning at the same speeds while the piston of the motor with the longer stroke would be running at 1 1-2 times the speed of that of the motor having the shorter stroke.

Best Gear Ratio

EDITOR THE AUTOMOBILE:

[3,007]—Which do you consider the better all-around gear ratio in regard to speed, hill-climbing and economy, 2.88 to 1 or 3.25 to 1, with 36-inch wheels and a 40-horsepower seven-passenger car?

(2) Is there any advantage or disadvantage in using chain adjusters on tire chains to keep them tight?

A. M. B.

Nashua, N. H.

(1) 3.25 would probably be better for all-around purposes.

(2) If the chains are so loose that they are apt to fall off there is a great advantage in using the tightening devices. On the other hand, chains should not be so tight that they are not free to creep about the tires or else they will greatly shorten the life of the casing.

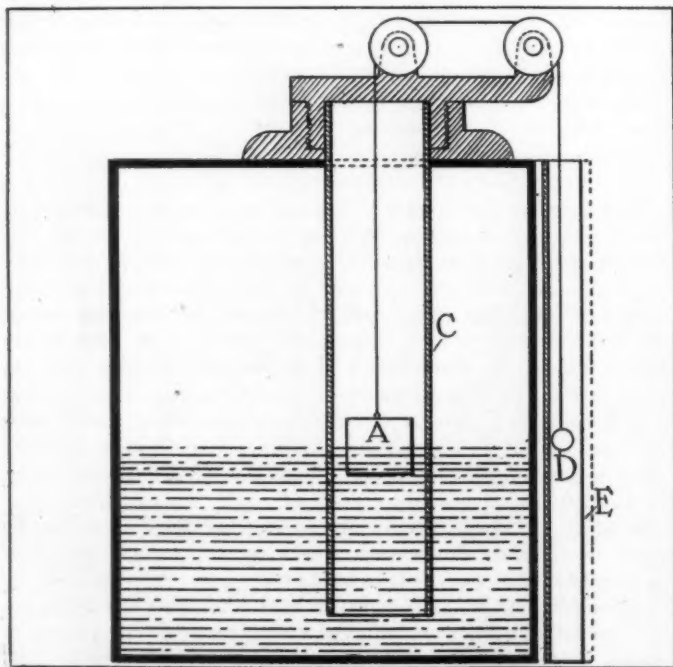


Fig. 1—Reader's idea for a simple gasoline gauge

Suggest Gasoline Gauge

EDITOR THE AUTOMOBILE:

[3,008]—In your issue of November 30 illustrating a gasoline tank gauge, advocated by Murray Fahnestock, I do not think it is the best for the following reasons: The glass gauge is liable to be broken and if the valve to the tank is not closed all the gasoline will be lost, and if it is closed you have to open it every time you look at it, and this is not handy as it will probably be under the floor. Another objection is danger of leakage at the valve and packing around the glass. From my

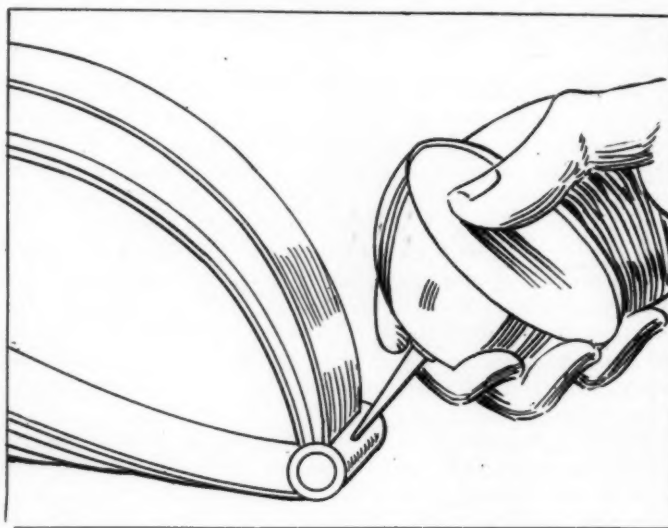


Fig. 2.—This oil hole should be replaced by a grease cup

8 years' experience with autos, I find the least number of joints about a tank the better it is. I submit a sketch of a gauge, Fig. 1, that I am going to put on my tank, to which these objections do not apply. The light pipe C extending down into the gasoline is open at the bottom and is simply a guide for the float A. On the face of the tank there can be put a small tube E in which the indicator D may move, so that it can be seen and the marking read. Any other guide or none at all can be used. This seems to make the simplest and best of any suggestion I have seen.

M. W. TREVOR

Lockport, N. Y.

Varying Compression

EDITOR THE AUTOMOBILE:

[3,009]—May I ask you if it would be possible to vary the compression in an automobile engine by varying the time of closure of the inlet valve, for instance, if the inlet valve would close at one-half or three-fourth the intake stroke of the piston, would not the compression be varied with the amount of the mixture admitted?

If this is desirable, I see no difficulty in making a camshaft which would be movable longitudinally, with the cams for the inlet valves varying in width so that sliding the camshaft would permit early closure of the inlet valve for low compression.

Grafton, W. Va.

MEDICO.

It would be very possible to make the arrangement you suggest, but there would not be any possible practical use to it.

Trouble with Spring Shackle

Editor THE AUTOMOBILE:

[3,010]—A shrill squeak issues from the spring joint of the front semi-elliptic spring of my otherwise fairly noiseless car. Could you tell me through THE AUTOMOBILE the best way to silence this?

DRIVERETTE

New York City.

A little oil will accomplish the desired result. You will find a small oil hole on the bearing surface to which oil may be applied as illustrated in Fig. 2. These oil holes are rather unsatisfactory and it would be better to take the car to a repair shop and have a grease cup fitted at a very small cost.

Regarding Motor Scavenging

Editor THE AUTOMOBILE:

[3,011]—As a subscriber to THE AUTOMOBILE, I would like to ask the following questions:

(1) Is it not a fact that nearly all the exhausted gas in the clearance compression space in the cylinder of a four-cycle in-

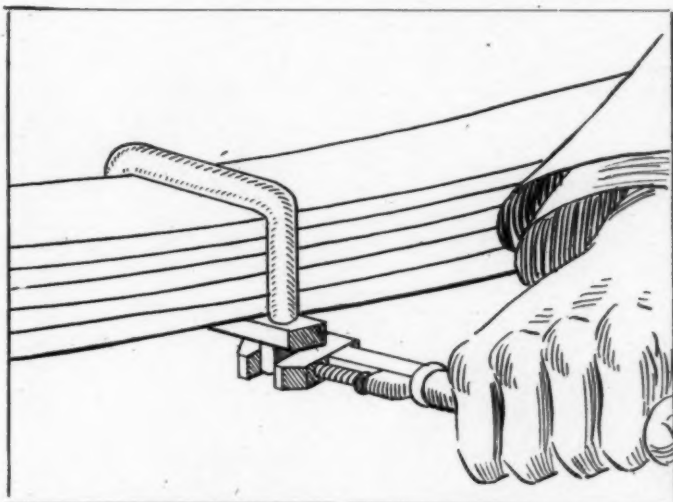


Fig. 3—This is a point which should be watched on a new car

ternal combustion engine remains in the cylinder and is mixed with the incoming explosive charge?

(2) If the cylinder was cleared of this exhausted gas, with exception of what little might remain in the inlet and exhaust ports, and cylinder filled with a pure explosive charge, wouldn't the horsepower of the engine be greatly increased?

(3) Do you know of any four-cycle engines that are perfect scavengers?

Calcite, Col.

C. P. HINDS.

(1) This has been found to be true.

(2) The horsepower would be increased to some extent owing to the fact that there would be more room for inflammable gases.

(3) While the degree of scavenging is high on any four-cycle motor we do not know of any which are perfect in this respect.

Wants Double Spark Magneto

Editor THE AUTOMOBILE:

[3,012]—Will you kindly answer the following queries through the columns of THE AUTOMOBILE: Is there a double spark magneto, if so please give the name of some firms making such?

C. M.

Pittsburgh, Pa.

Double spark magnetos are manufactured by all the leading makers of these instruments. They are now in common use and have proved to be such a success that the number manufactured by each maker is on the increase.

Keeping Spring Bolts Tight

Editor THE AUTOMOBILE:

[3,013]—I have just bought a new car and as it is the first car I ever owned I wish to be sure that I am taking good care of it. I have read the instructions to new owners in THE AUTOMOBILE with great interest and now take the liberty to ask where the spring clip bolts should be tightened as I have been advised that these must be watched in a new car.

Amesbury, Mass.

NEW SUBSCRIBER.

This is a very simple operation but will not be found to be necessary very often if ever. It is a good point to watch, however, and the method of doing the work is depicted in Fig. 3.

Ball Type Air Valve Explained

Editor THE AUTOMOBILE:

[3,014]—Would you kindly tell me through the columns of THE AUTOMOBILE what is the principle of the ball auxiliary air valve? I have read lately several articles which would seem to show that there are many who are using this type of valve in place of the spring-operated kind.

T. J. F.

Allentown, Pa.

The principle of the ball auxiliary air valve is shown in Fig. 4. The lower part of the illustration shows the ball when resting upon its seat and when lifted by the suction of the motor above. The upper part of the sketch shows the varying sizes of the balls. As the speed of the motor increases an extra suction occurs and the ball having the greatest area of seat is first lifted owing to the greatest total suction. The air will flow through as indicated by the arrows. On a further increase in the speed more of the balls will lift until finally they are all up at the highest possible engine speeds.

Oil-Barrel Will Not Burst

Editor THE AUTOMOBILE:

[3,015]—Being an attentive reader of THE AUTOMOBILE, I take the liberty to ask a question to be answered in the letter columns. Having just purchased some lubricating oil put up in an oak barrel, I would like to know if this barrel will burst if there is an air-hole drilled into it.

L. L. SNYDER.

Woodbine, Iowa.

There is no reason why the oil-barrel should burst if you put an air-hole in it.

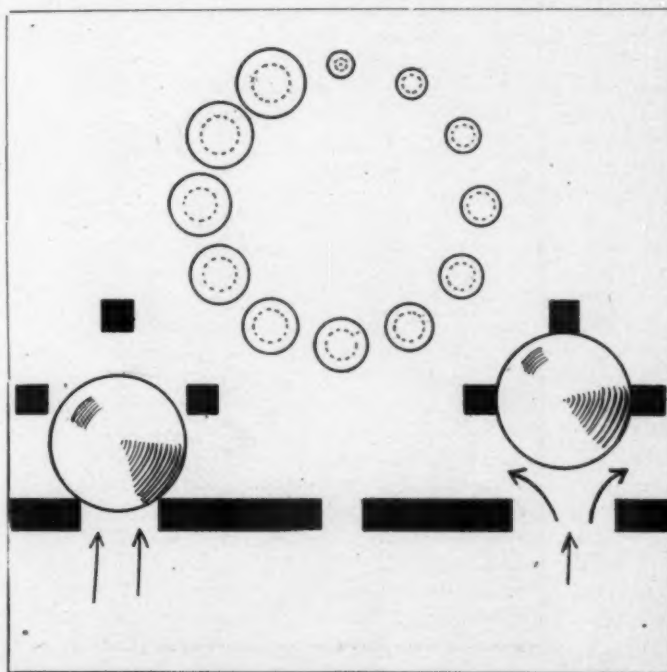


Fig. 4—Illustrating the principle of the ball type air valve

Pointers for Repairmen and Drivers

Remedying Blowholes; Oxy-Acetylene Welding; General Upkeep

STOPPING OIL LEAKS AT FLYWHEEL.—In the older cars there was a great amount of oil lost from the end of the crankcase nearest the flywheel on account of the oil leaking through the rear main bearing. It is also the case that in some of the newer cars the felt ring is not adequate to stop this leakage entirely and it is in such instances that the owner of the car may make a repair which will cut down his oil consumption to a great degree without an extraordinary amount of trouble.

As is shown in Fig. 1, the crankcase at the end bearing is hollowed out slightly. This is done either by taking the part to a milling machine, where the job will be done very cheaply, or else a key-way chisel is used and with light, careful blows of the mallet the part is given the dip shown. The bushing is then cut around the shaft so that there will be a small part of the length of the shaft bushing where the shaft does not come into contact with it. This groove will form an oil pocket into which it is desired to throw the oil which is in excess of the amount re-

ties should be removed by a file of fine emery so that there will be nothing which could possibly cause trouble by scoring the bearing when the motor is running. The action of this device is easily understood. The oil which is fed to the main bearing by the splash in the crankcase will find its way along the shaft until the ridge is reached, at which point most of it will be thrown off. At the same time there will be a sufficient quantity which passes the ring to maintain the oil film on the remainder of the shaft. This job, while one which will have to be done very carefully, will be permanent and will effectually stop the oil leakage. The varying shapes of the crankcase at the flywheel end will alter the procedure to some extent, but the principle will be the same, regardless of the shape of the casting, and there will be very few found to which this repair cannot be made. There is one point about the work which is rather unfavorable, and that is the cutting of the bearing bushing. If the groove could be cut in the crankcase back of the end of this bushing, as is often the case, cutting the bushing would be avoided.

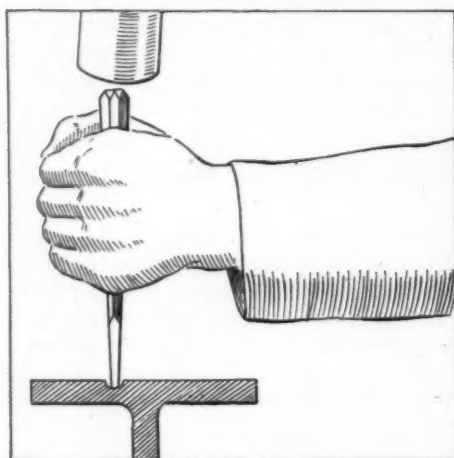


Fig. 1—A groove is chiseled into frame

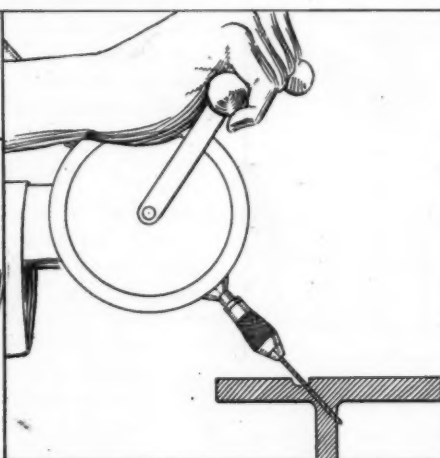


Fig. 2—An oil duct is then drilled

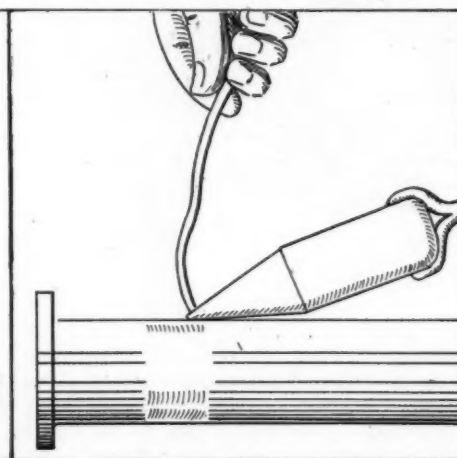


Fig. 3—Shaft tinned with prepared solder

quired for an oil film about the bearing. In order that the oil will be thrown into this groove and not allowed to pass by and out of the end of the crankcase as formerly it is necessary to arrange some device for catching the oil and throwing it into the cup which is formed by the annular opening about the crankshaft. A very slight groove having a depth of about 1-64 inch is cut about the crankshaft concentrically with the groove cut in the bearing. This cut in the crankshaft does not have to be as deep as stated, as even a slight circular abrasion made by a piece of fine emery will be sufficient. It is of the highest importance, however, that no abrasion is made outside of the space left vacant by the cutting of the groove in the bearing metal or else there will be difficulties with a hot bearing after the parts are reassembled.

The shaft is then tinned, Figs. 3 and 4, in such a way that there is a ring of solder about the grooved shaft. This ring of solder is then filed to an inverted V-shape so that the apex of the metal is at the circumference. This ring of metal will revolve in the annular opening in the bearing and will throw off any oil which finds its way along the shaft into the groove by centrifugal force. In order that the oil, which will be continually filling this groove, may have some outlet it is necessary to drill as is shown in Fig. 2. After having accomplished this, the part should be thoroughly cleaned up. That is, all the irregulari-

Clean Reflectors and Lamp Lenses.—While it should be hardly necessary to give advice on this subject, it would seem that this important fact is overlooked by a great number of autoists who are otherwise keenly on the alert to get the most for the money put into the car, as well as to have an outfit which does them credit by its appearance. It seems strange that a car owner will go to a large expense to secure the best lamps he can possibly procure and then to neglect them to such an extent that they soon reduce themselves to the level of the cheaper and less powerful grades.

The light thrown out by the lamp depends almost entirely on the polish of the reflector as long as the flame of the gas or the electric light is in good condition. A curious law which relates to heat as well as to light is that the best reflector is that having the greatest polish and that the radiating qualities of a body suffer as the reflecting power increases. In the case of heat, it is a well-known fact that a radiator covered with lampblack or other dull coating radiates an immense amount of heat, more than will a surface with a polish, such as nickel plate, for instance. Light and heat are remarkably alike in these respects, and it is easy to imagine when this is considered, how the dull, black, sooty coating on the reflector will interfere with its powers. This carbonaceous coating, which is nothing more or less than a crude form of lampblack, destroys the efficiency of the lamp to a re-

markable degree and at the same time does not lessen the consumption of gas if the lamp is of the acetylene type. In the case of an electric light the reflector is not soiled by soot, as there is no flame to which the reflector is subjected. Electric lamps are much more cleanly also as regards dust, as there are no air holes required to aid in the combustion of the gases. These air vents form entrance holes for dust and therefore the electric lamp is not very apt to be clogged with dust as is the acetylene type. However, from time to time it will be found advisable to clean the so-called dustproof electric lights as dirt will work its way through the most incredibly small holes and dim the reflector.

The necessity for cleaning the lens is too obvious to dwell upon. The medium through which the rays of the lamp are transmitted must of necessity be as clear as possible in order that the maximum power of the lamp be utilized.

Vibrations Loosen Nuts—One of the effects of the vibration of the motor and the shocks due to irregularities in the road is to loosen the nuts in different parts of the automobile. The point at which this assumes the greatest importance is in those nuts which fasten the motor to the frame of the chassis. Should these nuts become loose they will give rise to effects which may be disastrous if not taken in hand as they present themselves, on account of the fact that the disalignment caused by the play will give rise to rapid wear on the part of the bearings.

Besides the nuts on the motor itself there are those on the

will often cause the cylinder to miss continuously. If the insulation of the plug is defective it will often cause a leak in the circuit to such an extent that the ignition of the particular cylinder to which the plug is fitted will be permanently defective. A new plug should be immediately fitted if this is the case, as no repairs made to the plug will be satisfactory.

The vibration is so often the cause of ignition trouble that it may be well to test this next. The method of testing the vibrator is to connect up a circuit so that the vibrator will keep in motion, and then test it for the sound that it gives forth. This should be a smooth hum, such as is given forth by a bee, but should never approach a rattle, as when the adjustment is too loose, or a high, singing sound when the vibrator set-screw is too tight. If the vibrator will not work when the circuit is connected up the chances are that battery trouble is at the bottom of the situation. If the primary circuit is defective the vibrator will also refuse to work, as it is to this part of the current that the vibrator or trembler, as it is often called, owes its motion. If the vibrator points are rough or fused a fine file should be used lightly upon them to restore them to their shape. Care should be taken, however, not to bear upon them too heavily and so cut off too much as trouble will result.

The secondary may be affected by a number of things, but the greatest of these is defective insulation. The points where leakage occurs may generally be determined at night by allowing the current to flow while the car is in darkness. If there is a leakage at any point it will be noticed that a spark will show

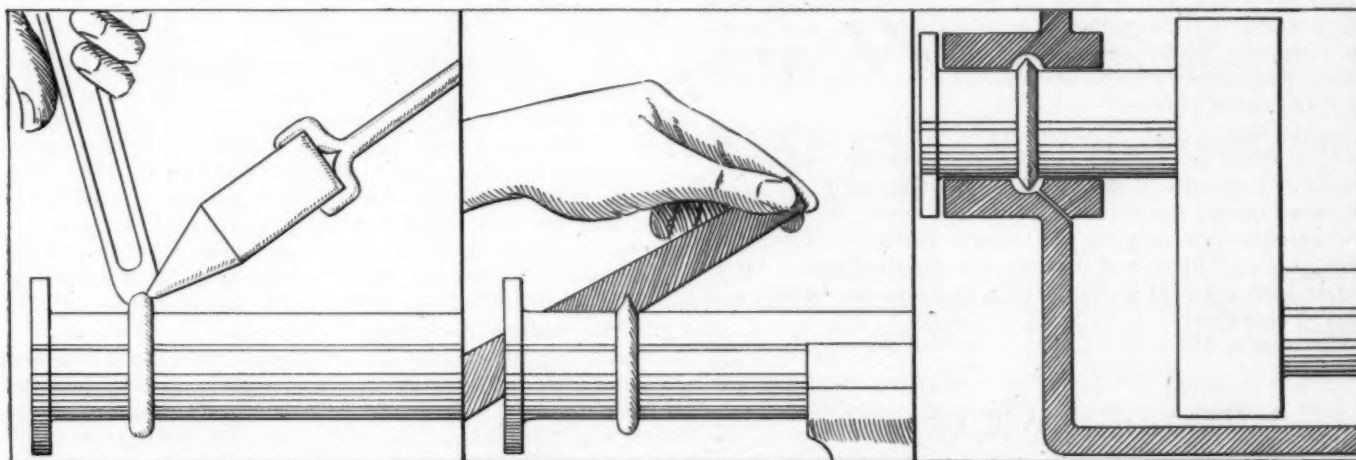


Fig. 4—Regular plumbing solder may be used

Fig. 5—Ring filed to a point at circumference

Fig. 6—Showing the finished job

gearset and differential housing which are submitted to the jars of the road and the continuous vibration of the motor. It is not very possible that all the nuts in the differential housing, for instance, should fall off, but there is a possibility that the looseness due to the fact that the bolts are out of position will allow the dust to get into the housing and cause an accumulation of grit which will cause the bearings to wear rapidly.

Testing the Ignition System—There are two things about the automobile motor which are the bugaboo of the new motorist; they are the ignition system and the carbureter. As soon as a miss occurs in one cylinder, the average new motorist will grab a wrench and start for the carbureter and unless his hand is checked before any serious damage is done a perfectly good car will be put in charge of the repairman and a large bill be the result. In case it is determined that the trouble is in the ignition system, as many seeming carbureter troubles are, the first step is to determine what part of the system is responsible. This may be arrived at by a process of elimination. If there is only one cylinder which is missing, the trouble is very apt to be in the spark-plug and a great amount of time may be saved by looking at the distance between the contact points at once. These should be between 1-32 and 1-64 inch apart and should be perfectly clean. The resistance interposed to the spark by a fouled contact point

at the point of leakage. It is the nature for the current of electricity in the same manner to jump across the line of least resistance. If this point of least resistance is between the points of the plug the spark will be in the correct place. On the other hand, if the insulation is broken down at some point the spark will be very apt to cross at this point instead of in the proper place.

One of the most important things for the amateur to remember, however, is not to take down the magneto. This should be either left to the factory or to some competent repairman who is versed in the manufacture of the magneto. The magneto is readily accessible in so far as the minor points of adjustment are concerned and it is not necessary to do any disassembling of any kind. The principal enemy of the instrument is dirt, which is very apt to accumulate and consisting for the most part of gummy oil and other deposits. The dirt may be readily cleaned from the brushes and other points of accumulation by means of gasoline, which will cut the deposits readily. The contact points in the breaker box should just clear each other by a shade and under no circumstances should be separated by more than 1-32 inch. Ignition difficulties may spring from a number of causes, but, with ordinary care in keeping contact points bright and clean and binding-post screws tight, the troubles will be minimized.

The Ideal Automobile for 1913

Some of Our Readers' Conceptions of What Next Year's Car Should Be

Sounds Like Real Manufacturer

EDITOR THE AUTOMOBILE:

I have taken interest in your topic, My Ideal Automobile, and have drawn up a sketch to illustrate what I would wish for my own personal use. It is essentially a racing chassis with enlarged wheels and with a large, roomy body put on. The hood, of course, has been lengthened to suit the lines.

As to specifications, the wheelbase would be 100 inches, the motor a 40-horsepower Excelsior type, the carbureter of Schebler make, the ignition by Bosch magneto and Atwater-Kent apparatus and the radiator a full honeycomb Mercedes type. A cone clutch would be used and the transmission would be a Timken with four speeds forward and reverse. The torque arm would be V-shaped with double spring buffer. The frame would be drop-forged channel steel. A Timken floating rear axle and Timken I-beam front axle would be used. The brakes would be pressed steel, 16 inches in diameter, while the wheels would be of specially constructed artillery type, carrying tires which would be either 36 inches by 4 inches or of a size to suit the customer. The body would be of sheet metal with hand-buffed upholstery. Toe-boards and foot-rests would be made of pyramided aluminum.

The standard colors for this car would be flame scarlet, royal maroon (deep or bright), carmine with crimson striping, or any other color at a slight extra charge of \$25.00.

The equipment would consist of a top, rain-vision windshield, two gas-electric headlights, two electric sidelights, electric tail light, storage battery and dynamo for operating these, Prest-O-Lite tank, complete tool and tire repair kits, tire inflator and demountable rims.

Minneapolis, Minn.

CHAS. W. JACOBS.

Thinks Ideal Will Be Local

EDITOR THE AUTOMOBILE:

In reaching a conclusion as to what combination of mechanical details would constitute the ideal car, it is necessary to consider the different conditions under which it is to be run, namely, climate, topography of the surrounding country, the driver and his understanding of the internal mechanism of

the car. So that the specifications which follow are ideal only in so far as they apply to a car to be run under conditions which are similar to those encountered by the writer.

Motor: Four-cylinder, 4 1-4 inches by 5 1-2 inches, with the cylinders of the T-head type, cast in pairs. This admits of the use of large valves with more chance for the free circulation of air around the seats and stems.

Crankshaft: Three-bearing, of generous proportions, supported on boxes of bronze, lined with Parson's white bearing metal. This would be used because of its good anti-friction qualities, simplicity and long life.

Oiling System: Circulating, using the lower part of the crankcase as an oil reservoir, and a gear-pump to keep the motor generously supplied with the necessary lubricant. This is superior in every-day service for the man who cares for his own car.

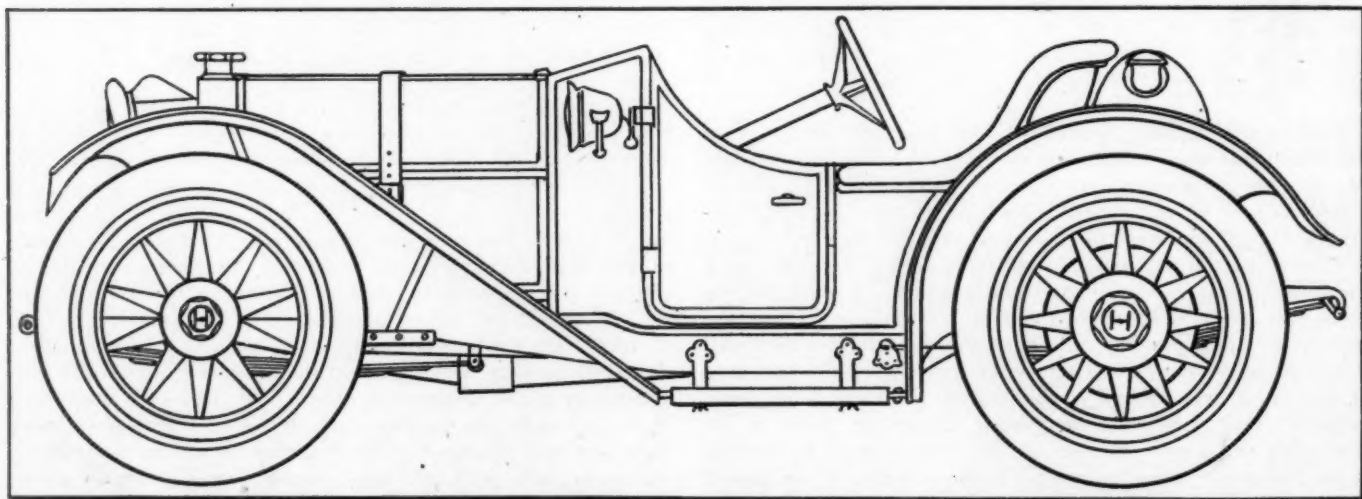
Cooling System: Thermo-syphon, because of its simplicity and the fact that the water circulates according to the temperature and not in proportion to the speed of the engine, as the case where a geared pump is used.

Ignition: Bosch high-tension system with variable-spark advance, because of the small amount of wiring required and the remarkable freedom from annoying adjustments. The spark-plugs would be of the Bosch type with stone insulation.

Transmission: Four-speed, selective, sliding-gear type. This gearset, while slightly more complicated and costly to manufacture than the more common three-speed type, has the great advantage of allowing the motor to turn over more moderately when driving the car at a good average speed in level country. It also has the ability to propel the car at a good pace on stiff gradients without overheating.

Clutch: Cone type, metal to metal with cork inserts, running in oil. The motor, clutch and transmission would form one unit, suspended on three points, because of the perfect alignment which this gives at all times, regardless of the twisting of the frame while passing over rough roads.

Rear Construction: Floating type, equipped with Hyatt roller and Hess-Bright ball thrust bearings next to the differential. The housing would be of a combination tubular and drop-forged construction, similar to the Stearns and Alco. It is rigid and keeps the rear axle bearings in perfect alignment.



Reader's drawing of his ideal car, as described on this page. Note wheels and suspension

The propeller shaft and single universal joint would be enclosed, running on Hess-Bright ball bearings with the tubular casing around the shaft, designed so as to act as the torsion rod. This gives a simple, effective drive of long life.

Brakes: Four Raymond type brakes, fitted with large diameter drums with wide faces, so that the temperature of these friction surfaces could be kept as low as possible while going down the long grades which are encountered continuously in mountain touring.

Front Axle: I-beam, drop-forged. The front wheels would be fitted with Timken roller bearings.

The motor would be self-starting by the compressed air system because of the simplicity, reliability and absence of wiring. These considerations make this method of self-starting more desirable than those systems wherein the operation is accomplished by either acetylene gas or electricity. Also, the reserved air may be used for inflating tires, which in itself is a very desirable feature.

A runabout body, mounted on a chassis with a wheelbase of 114 inches, equipped with fore-doors and dashboard ventilators, also a large gasoline and reserve oil tank in the rear, as well as provision for carrying two spare tire casings would be best suited for the requirements of the writer.

These specifications cover a car which could be taken care

of and used with great satisfaction in any part of New England by the average man possessing a fair knowledge of the automobile and its construction. This would be true both in moderate upkeep expense and freedom from annoying repairs and adjustments.

Pawtucket, R. I.

NORMAN R. EARLE.

[Editor's Note—The reader will note that we have changed the heading of these columns so that they now deal with the 1913 car. It will not be very long before cars bearing this date will be upon the market and it is an exceedingly fitting time for either the laity or the trade to express their opinions on the general trend of American practice. This department having long since proved its popularity, the invitation is again extended to those who have views on this interesting subject to submit them to THE AUTOMOBILE.

Owing to the severity of the weather at this time of the year, the rocking chair fleet of automobilists is largely increased. Ruminating on the tours of the previous summer, many little experiences of mechanical difficulties happily solved or of troubles ingeniously avoided will be bound to occur. These would doubtless make interesting reading, and the columns of THE AUTOMOBILE are cordially opened to those who care to communicate their experiences through them.]

Carbon Deposits Due to Varied Causes

Carbon-Silicious Scale in Cylinders Is Not Always the Result of the Quality and Quantity of Lubricant Used

ABOUT 10 years ago gasoline was plentiful and, in fact, at that time it was really hard to dispose of it. Refiners ran their crudes as far as it was possible rather than gasoline. Consequently the gasoline of that period was of a very high Baumé gravity, and very volatile. Quite naturally it combined with the oxygen of the air more readily than a heavier product, and when the combination of this gasoline vapor and oxygen was burned in the cylinders a minimum residue was left.

With the increased demand for gasoline, petroleum refiners found their position exactly reversed: gasoline was really scarce; there was only one thing that could be done and that was to increase the percentage of gasoline distilled from a given amount of crude oil. However, this meant the producing of a lower gravity or heavier product, that was not nearly so volatile as the earlier product and in some instances was but slightly lighter than kerosene. With this lower quality of gasoline there is not always complete combustion.

If a small amount of gasoline and kerosene each are burned in separate partially covered cups the first will flash off rapidly and leave practically no soot, while the other will burn more slowly and leave quite a little soot or carbon. Likewise, gasoline, which is but little more volatile than kerosene, burns hardly faster than the latter and but slightly more completely.

Therefore there are cases where the gasoline and not the oil is the cause of carbon deposits.

When the gasoline mixture is too rich this state of affairs is often the cause of large amounts of carbon. For it is not possible during the explosion stroke of the motor to get complete combustion if the mixture is too highly saturated.

A careful chemical analysis of the carbon scrapings, taken from the interior of the cylinders of automobile gas engines, very often shows that they are largely composed of silicate. Silicates are nearly always of a gritty nature. When grit

is drawn in through the carbureter with the mixture into the cylinders it is retained there by the partially burned oil, and the heat of combustion bakes it onto the cylinder walls in hard, brittle deposits.

In view of this condition it might be well to suggest to manufacturers of carbureters and to designers of motors to modify or change their designs so as to prevent, as far as it is possible, the road dust from being drawn into the interior of the gas engine. If they succeed in doing this they will have removed one of the causes of deposits in the cylinders and also reduced the wear of the bearings in the crankcase.

Another thing which causes carbon deposits is that after an automobile has been run for a certain length of time the exhaust pipe and muffler are apt to become more or less clogged with carbon, dust, dirt and partially burned oil. When there is a back pressure and when the motor cannot exhaust freely carbon trouble is caused by the incomplete scavenging or cleaning out of the cylinders. Another thing which makes it equally important to have the burned gases carried off quickly is the importance of having the explosion chamber clean when the suction stroke takes place.

Drivers of racing cars invariably insist on securing a high-gravity, volatile gasoline, a lubricating oil of proved worth and one that is known to deposit a minimum amount of carbon; besides, as their cars are not equipped with mufflers, there is no chance of stoppage in the exhaust.

Summing the entire matter up, the automobilist desiring the best results and the least carbon from his motor ought to use as light a gasoline as it is possible for him to secure; secondly, he should be careful to see that the motor is not running on too rich a mixture; thirdly, see that the exhaust pipe and muffler are clean; fourthly, keep as much of the road dust as possible out of the carbureter and motor and, finally, use only an oil of known merit.

Automobile Metallurgy Made Easy

By E. F. LAKE

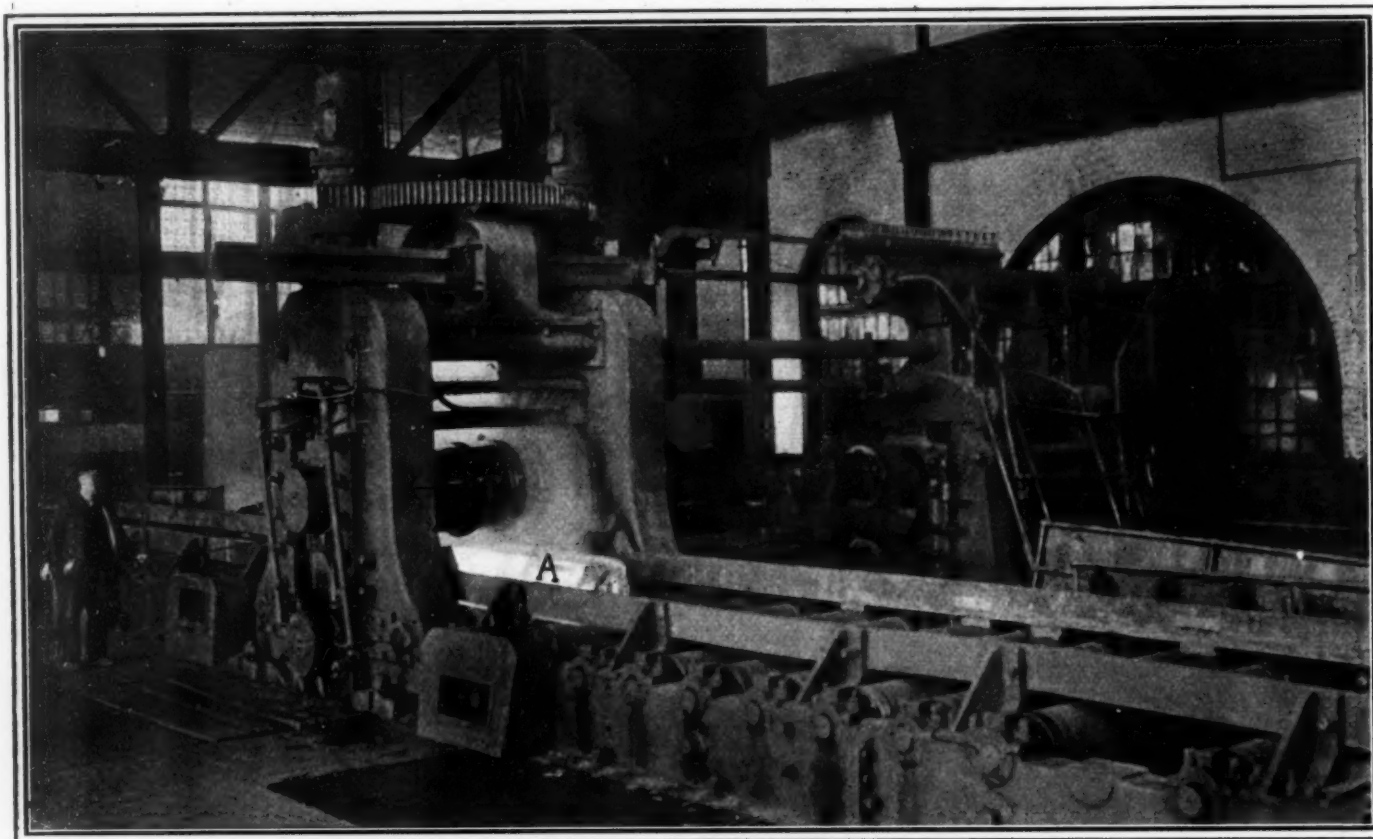


Fig. 1.—Showing the first operation in the process of rolling steel

AFTER steels have been made and cast into ingots by either the Bessemer, open-hearth, crucible or electric processes, they are nearly always rolled down to the desired sizes and shapes. In most cases the different buildings are so arranged that the melting down of the ore into pig iron, the making of this into steel, and the rolling of it into the finished shapes, form a continuous operation. In such cases the metal does not have a chance to cool off from the time the ore is first melted until the steel is ready to ship to the consumer. This is especially so of railroad rails and structural steel shapes. The first rolling operation is shown by the slabbing mill, Fig. 1. Here an ingot A is shown just after passing through the rolls R. These have been made to reduce the ingot 1 inch in size while passing once through the rolls, but in the finishing rolls from 1-8 to 1-4 inch is about all the reduction that is allowed.

All of the steels that are made into forgings, or are pressed or stamped into shapes for automobile use, are first rolled into bars or sheets of a convenient size and shape. A large quantity of steel is used in motor car construction that is not forged, pressed, etc., but the metal is taken as it leaves the rolls and machined into the proper form for its respective part. Frames are entirely constructed from rolled angle irons and plates that are bent, cut and riveted together. All tubes such as those used for the steering apparatus or rear axles are made from rolled

Part XI—Rolled Steel

This Material is Much Used in Automobile Construction; Gradations in Quality Are Many and Important

steels. All shafts and rods, such as change speed gearset shafts, driving shafts or axle shafts, connecting rods for the steering knuckles, etc., are rolled steels. In fact, there are so many parts made from rolled steel that it would take too much time to enumerate them all.

Rolled steels are made from all kinds of steel-making materials and they are made in all of the shapes and sizes that are required for automobile work. Hence, it is possible to obtain in the open market, at prices according to their quality, the lowest grades of ordinary carbon steel or the very highest grades of nickel-chrome steel as well as all of the carbon or special alloy steels between these two grades.

The variety from which to choose is so great that much difference of opinion exists as to which is the best for a given part. The steels most commonly used for automobile construction might be classed according to their quality, as follows: Low carbon, medium carbon, high carbon, low nickel, high nickel, chrome, vanadium, titanium, vanadium-chrome, and nickel-chrome steels. The steel-making process used in their manufacture might alter their position in this list, as a crucible or electric-made nickel steel might be made better in quality than a nickel-chrome steel if it were made in an open-hearth furnace. It is, therefore, necessary to know how it is made before placing final judgment on the quality of any steel.

The tensile strength of rolled steel varies all the way from

60,000 pounds per square inch to nearly 300,000 pounds and the other mechanical properties vary in like proportion. To say, therefore, that one has a nickel or nickel-chrome steel in a given part means nothing unless the steel has been properly made; if not, it might even be excelled by carbon steel that was properly made. Likewise, the heat treatment that any of the steels is given would cause them to show a great variation, as annealing, hardening and tempering alter their grain structure and their toughness, wearing qualities, etc.

To give steels their best properties, it is necessary to have the metal at a correct temperature when the last rolling operation takes place in the finishing rolls. The grain structure of steel is greatly changed by heat. This grain structure forms into coarse crystals when the metal is poured into ingots and cooled down from a liquid state. This crystallization gives the molecules that form the mass a comparatively low cohesive force and hence the metal is not so strong as it can be made. When passed through rolls at the correct temperature, this crystalline grain structure is broken up and a new one takes its place. This latter is much finer and has a greater cohesive force.

Steels are usually heated to 2,000 degrees Fahr., where the rolling operations are started. If when passing through the finishing rolls, the temperature is falling from 1,650 to 1,400 degrees Fahr., the grain structure will be as fine and dense as it is possible to make it and the metal will have all of its inherent strength. The temperature should never be allowed to fall below 1,300 degrees Fahr., until all the rolling operations have been finished. It is much better to pass it through the rolls several times when reducing it to the proper size than it is to try to do this with one operation. If the temperature falls

too low while rolling steels, strains are set up and checks and flaws are liable to be started. The strains can be overcome by thoroughly annealing the metal after rolling and this is almost always done in steels used for automobile parts. Checks or flaws cannot be cured without cutting out that part of the metal or re-melting and re-rolling it.

About the surest or only way to judge these steels, therefore, is by the mechanical properties they have or will show from a test. If both the elastic limit and reduction of area show comparatively high figures, it is safe to say they are good steels for the purpose for which they have been used. For certain parts, however, it might be well to know what figures the tensile test gave, or the elongation, torsion, vibrational, impact, hardness, shearing or bending tests.

It is not difficult to obtain the figures for these, as very few manufacturers design or build motor cars without first thoroughly testing the materials from which the parts are to be made.

For Checking the Wheels

A French house has placed on the accessory market a device intended to relieve travelers of the necessity of finding stones to chock under the wheels when there is need of leaving a car standing on a steep hillside. It is in the likeness of a large hinge, and to one of the hinge leaves there is again hinged a triangular piece of steel, which consequently may be placed on edge against the other leaf, so that the whole forms a substantial wedge. The main leaves are, of course, perforated to reduce the weight, and, when folded up, the device occupies but small space in the touring car. In an emergency three such wedges may be piled up high enough to act as a jack under an axle.—*From Omnia-Locomotion*, January 6.

Calendar of Coming Automobile Events

What the Future Has in Store for the Motoring Enthusiast

Shows

- | | | | |
|----------------------|---|----------------------|--|
| Jan. 27-Feb. 10..... | Chicago Coliseum, Eleventh Annual Automobile Show, under the auspices of the National Association of Automobile Manufacturers. Pleasure cars, first week. Commercial vehicles, second week. | Feb. 19-24..... | Hartford, Conn., Annual Show, Automobile Club of Hartford, State Armory. |
| Jan. 27-Feb. 10..... | Pittsburgh, Pa., Sixth Annual Show, Automobile Dealers' Association of Pittsburgh, Inc. Pleasure cars first week. Commercial vehicles, second week. | Feb. 19-26..... | Cincinnati, O., Annual Show, Music Hall, Cincinnati Automobile Dealers' Association. |
| Jan. 29-Feb. 3..... | Scranton, Pa., 13th Regiment Armory, Second Annual Show. | Feb. 20-24..... | Binghamton, N. Y., State Armory, Third Annual Show, Automobile Dealers' Association. |
| Feb. 3-10..... | Montreal, Canada, National Show, Drill Hall, Automobile Club of Canada. | Feb. 20-28..... | Baltimore, Md., Annual Show, Baltimore Automobile Dealers' Association. |
| Feb. 3-10..... | Harrisburg, Pa., Third Annual Show, Arena. | Feb. 21-28..... | Toronto, Ont., Annual Show, St. Lawrence Arena, Canadian National Automobile Association. |
| Feb. 5-8..... | Lima, O., Annual Show, Auditorium, Lima Automobile Dealers' and Garage Proprietors' Association. | Feb. 24-March 2..... | Brooklyn, N. Y., Twenty-third Regiment Armory, Annual Show, Brooklyn Motor Vehicle Dealers' Association. |
| Feb. 5-17..... | St. Louis, Mo., Coliseum, Annual Show, Pleasure cars, first week. Commercial vehicles, second week. | Feb. 26-Mar. 2..... | Paterson, N. J., Annual Show, Fifth Regiment Armory, Paterson Automobile Trade Association. |
| Feb. 7-9..... | London, Ont., Accessories' Annual Show. | Feb. 26-Mar. 3..... | Quincy, Ill., Highland Park Stone Pavilion, Annual Mississippi Valley Show, Quincy Auto Club. |
| Feb. 10-17..... | Atlanta, Ga., Auditorium-Armory, Atlanta Automobile and Accessory Dealers' Association. | Feb. 27-Mar. 2..... | Elmira, N. Y., Second Annual Show, Elmira Automobile Club. |
| Feb. 12-17..... | Ottawa, Ont., Howick Hall, Annual Show, Ottawa Valley Motor Car Association. | Feb. 28-Mar. 2..... | Davenport, Iowa, Annual Show, Davenport Automobile Association. |
| Feb. 12-17..... | Kansas City, Mo., Annual Show, Combined Association of Motor Car Dealers. | Feb. 29-Mar. 2..... | Fort Wayne, Ind., Fort Wayne Automobile Show Association. |
| Feb. 12-17..... | Troy, N. Y., Second Annual Show, State Armory, Troy Automobile Dealers. | March 2-9..... | Boston, Mass., Tenth Annual Show, Boston Automobile Dealers' Association, Inc. |
| Feb. 12-19..... | Dayton, O., Third Annual Show, Dayton Automobile Club. | March 4-9..... | Reading, Pa., Reading Railroad Shops, Annual Show, American Exposition Company. |
| Feb. 14-17..... | Grand Rapids, Mich., Third Annual Show. | March 12-16..... | Denver, Col., Auditorium, Annual Show, Motor Field, A. Wahlgreen, Manager. |
| Feb. 17-24..... | Pittsburgh, Pa., Second Annual Show, Exposition Bldg., Pittsburgh Auto Show Association, Inc. | March 6-9..... | Louisville, Ky., Fifth Annual Show, First Regiment Armory, Louisville Automobile Dealers' Association. |
| Feb. 17-24..... | Cleveland, O., Annual Show. | March 6-9..... | Tiffin, O., Second Annual Show, The Advertiser. |
| Feb. 17-24..... | Newark, N. J., Fifth Annual Automobile Show, New Jersey Automobile Exhibition Company, First Regiment Armory. | March 12-16..... | Syracuse, N. Y., Fourth Annual Show, State Armory, Syracuse Automobile Dealers' Association. |
| Feb. 17-24..... | Minneapolis, Minn., National Guard Armory and Coliseum Annual Automobile Show, Minneapolis Automobile Show Association. | March 25-30..... | Indianapolis, Ind., Annual Show, University Park, Indianapolis Automobile Trade Association. |
| Feb. 19-24..... | Omaha, Neb., Seventh Annual Show, Auditorium, Omaha Automobile Show Association. | | |

Race Meets, Runs, Hill Climbs, Etc.

- April 27.....Philadelphia, Annual Roadability Run, Quaker City Motor Club.

THE AUTOMOBILE

Vol. XXVI

Thursday, February 1, 1912

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Electrics Big Gainers

IT is but meet that Chicago, being the home of the electric pleasure vehicle and its the biggest stronghold today, should feature these popular vehicles at the annual Chicago automobile show. The representation of electric pleasure cars in both the Coliseum and Armory is much in advance of that seen at either of the recent New York shows, and along Michigan avenue at the different salesrooms are several other makes not fortunate enough to get space within the show enclosures. In all there are over a score of electric makers. While it is true that several of them are quite new, more than half a dozen of them having entered the field during the last six months, yet it is also a fact that many of the older makers and some of the new ones, too, are counting their annual products in the thousands, whereas but a year or two ago it was a banner performance if a few hundred machines were built.

The electrics have grown in numbers and they also show wonderful development from an engineering point of view. In another portion of this issue the trend from a semi-technical point of view is outlined. This trend is more or less following the lines of progress marked out by the gasoline engineers, and there is nothing derogatory in the statement that the electric makers are following in the wake of the gasoline engineers. This trend is particularly noticeable in the vast strides that shaft drive has made during the past year. Several old-time

builders, who previously manufactured nothing but chain-driven machines, have now discarded chain drive body and soul and have landslided to shaft drive. They have taken up shaft drive because it is quieter and cleaner. The garageman would sooner take care of a shaft-driven machine than a chain-driven one, and these personages have more or less influence with the buyers. Some of those who have continued with chain drive have added chain cases which permit of the chains running in oil.

But some makers are going still further, and are adding what is properly designated direct drive. Three firms incorporate the motor as an integral part of the back axle and drive direct by either bevels or worm from the armature shaft to the differential. This should be the drive of greatest efficiency, as the universal joint is eliminated, and even the straight-line drive argument can be set aside. From the point of view of construction it is a good manufacturing proposition, and it is noted that machines using this drive are generally listed at under \$2,000. Placing the motor in front of the rear axle makes it very accessible and gives an even distribution of weight as well as a low center of gravity.

The electric makers must be congratulated on the general lowering of the bodies for this season. The old days of the step-ladder design are over and now the running boards are so placed as to be very little higher than the standard curb. This lowering has been brought about by imitating gasoline car methods; that is, dropping the side members of the frame from 4 to 6 inches in front of the back axle. One maker has gone still further and set a new fashion by using the bottle-neck frame to reduce the diameter of the turning circle of the car.

Perhaps best of all in the electric field is the improvement in the brakes. There is scarcely a maker but now fits two sets of mechanical brakes, one or both sets acting direct on the rear wheel drums. This is good engineering work, and excellent so far as safety is concerned. The brakes, too, are larger, the drums in some cases being increased 50 per cent. in diameter. Not only have the drums been increased but the pedal leverage has been improved to give more positive control. In the matter of entirely enclosing the brakes, the electric makers are going a little further than their gasoline brethren, and it is safe to say that they are leading in this respect. The expanding brake is quite general, and where two sets are expanding they are either placed side by side or expand with concentric drums. Putting the brakes inside of the drums gives a dust-proof construction and also a very neat job. There are remarkably few cases of the external hand brake on the rear wheel. The use of the electric brake is on the wane, there being very few cases where it is used.

The electric car makers have made more progress in the matter of fool-proof control than have the gasoline concerns. It has been a necessity with the electric builder. He has a range of up to six variations in forward speeds and as many reverse positions. The danger of getting into reverse unexpectedly and thereby causing an accident has made it imperative to fit controllers whereby the controller must come into neutral from a forward-speed position before it can go into reverse. This is as positive as the fact that two and two make four. For emergency cases several makers combine the controller and motor mechanical brake, so that while

bringing the controller into neutral a still further rearward movement brings an electrical and perhaps a mechanical brake into use. It is along the same line as the single-pedal control in gasoline cars; namely, that in which a forward movement of the pedal disengages the clutch and a still further movement applies the brake. Frequently the emergency brake is so arranged that when applied it automatically shuts off the power. On many types are interconnections whereby throwing up the steering lever in order to get out of the driver's seat locks the emergency brake on and brings the controller into the neutral position, thereby acting as a safeguard against thieving and also against wasting current with the car idle.

The electric vehicle is coming into its own, but what is needed most of all is co-operation among the different makers. Heretofore there has been too much hostility; they did not seem to be able to meet in friendly conferences as do the gasoline men for mutual benefit. Much

of the progress of the electric of today is due to the energy and money expended by the central stations in the big cities, the central electric stations doing much to bring the electric pleasure vehicle and truck to the attention of the buyer. Many of the electric dealers should wake and get into closer touch with the big selling factors. They should get out and develop a field rather than wait around the salesroom for buyers. Education is what is needed with the electric, and also demonstrations. The usefulness of electrics for city work could be demonstrated in a score of different competitions; and such would be much more valuable than cross-country runs in trying to make records for battery mileage, which runs are not in good repute at the present time. The performances are often discredited by the public on the ground that extra batteries—and in some cases special types of batteries—have been used, the impression being given to the public that they were stock. Competition is what the electrics need.

Briscoe Advises A.A.A. to Abandon Speed Contests

States That Racing Has Accomplished Its Purpose

BENJAMIN BRISCOE, president of the United States Motor Company, has prepared a letter to the American Automobile Association advising that it abandon the control of speed contests and devote its time to the promotion and encouragement of touring and reliability contests and particularly to good road work.

"More than a year ago we decided that our company would not support speed contests with the perils that are always present at such affairs, both from the standpoint of the public as well as the drivers and mechanics," said Mr. Briscoe recently. "There has been every evidence that the stand of the United States Motor Company received general endorsement, for since that time there has been a further decrease in racing interest, a lessening of public support and a general sentiment that, much as we owe to racing for what it taught us six or eight years ago, it is no longer needed by the industry or the public.

"It, therefore, seems to me illogical that the American Automobile Association, that has done so much for the motor-car industry and motor car owners, should spend any of its time, its money or prestige in an endeavor to regulate or govern high-speed contests, when there are so few meetings and such meager support, to say nothing of the little that motor car makers can learn from such affairs at this advanced stage of the industry.

"In the case of new makers or makers testing untried products there may be something to learn from speed contests, but it is a matter of record that, with comparatively few exceptions, none of the old-time manufacturers are indulging in contests of speed. Many of them, appreciating the fact that the public likes to have proved the reliability and endurance of motor cars, are competing in reliability and endurance runs, which supply ample evidence of the leadership of American motor cars.

"Except in the case where cars of abnormal horsepower are built, our American makers have proved that they can build just as fast motor cars as any manufacturer in the world. It is a fact, however, that many people dislike to buy cars that are famous in racing because of the thought that they may not be proper for use in touring and general utility, which, after all, is the real work of the modern vehicle of transportation.

"I will, therefore, advise that our National body abandon the government of speed contests, turning it over to any organiza-

tion that will care for it, leaving the A. A. A. to continue its good work in connection with roads, legislation, foreign and American touring maps, guide books and touring contests."

Syracuse Club Out of A.A.A.

SYRACUSE, N. Y., Jan. 27—There is wide interest among the other clubs of the state in the action, taken this month by The Automobile Club of Syracuse, commonly known as The Live Wire Club, in finally declining re-affiliation with The New York State Automobile Association. The Syracuse club has not been in good standing with the parent body for some time, and though President Deer, of the State body, made several trips here to urge the local club to re-enter the fold, formal refusal has been made in a resolution unanimously adopted. This resolution declares the thorough sympathy of the Syracuse club with the State body's aims but declines membership on the ground of unfairness in the amount of dues asked.

Secretary Forman Wilkinson, of the Syracuse club, explains that the State association desires the Syracuse club to pay an annual membership fee of \$500. While the local club is the fourth largest in the state, the membership fee asked is equal to that paid by the Buffalo club, which is four times as large, and the Rochester club, which is twice the size of the Syracuse organization. In addition, \$200 is solicited in support of the State body's organ, *The Empire State Motorist*. The total of yearly dues asked, \$700, is just about what the Syracuse club spends annually in danger and route sign work.

Officials at A. A. A. headquarters declare that the trouble with the Syracuse club started over a year ago and culminated last fall when the club was suspended for non-payment of dues.

A high tribute was paid Hurlbut W. Smith Tuesday night at the annual meeting of the club at The Onondaga. Mr. Smith had served 10 years as president and had said to the nominating committee that he thought he had held the office long enough. Nevertheless, his name was again presented, and upon his attempting to withdraw it he was cried down and forthwith elected. Other officers chosen are: H. W. Chapin, first vice-president; Alexander T. Jenney, second vice-president; Forman Wilkinson, secretary and treasurer.

Belgian Salon Truly International Affair

Fine Showing of French, English, German and Italian Cars

SATURDAY, January 13, the eleventh annual automobile salon of Belgium was opened at the Cinquantenaire Palace at Brussels with a representative collection of Belgian, English, French, German and Italian automobiles and motor trucks on the ground floor, bicycles and tires

comparison with the motors of this type which this company first turned out, and the movement of the sleeves has, of course, been lengthened correspondingly at the same time. The 16-horsepower model now has 80-mm. bore by 125-mm. stroke. the 26-horsepower model 100-mm. bore by 140-mm. stroke and



General View of the Belgian Salon in the Cinquantenaire Palace, Brussels

in the galleries and, fronting the latter, many aeroplanes. As at all recent Brussels shows, the management had aimed to make the exhibition pretty and cozy, as well as imposing. Floral displays at all stands and, around the supporting columns of the vast hall, wreaths of roses draped along the galleries and a generous intermixture of gold, red and electric lights in the decorations combined to produce a very pleasing impression on the spectators.

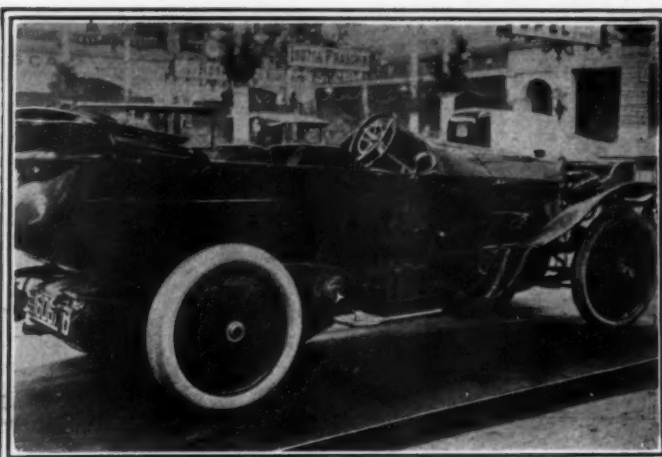
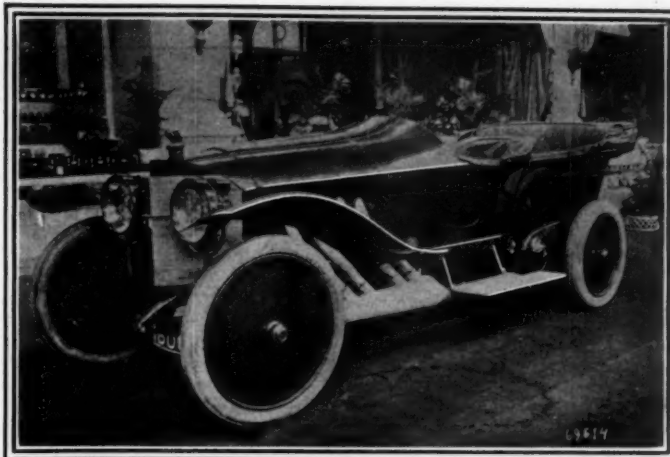
Among the prominent Belgian lines of manufacture, the Minerva, the Pipe, the F. N., the Nagant, the S. A. V. A. and the Métallurgique, a few construction features are noticed which may be of general interest, partly from a mechanical viewpoint, but especially because the Belgian cars are built mostly for export, since the home market is comparatively insignificant, and therefore reflect an international standard of construction and of prices.

In the three Minerva models, all with four-cylinder valve-

less Knight motors, the piston stroke has been lengthened in the 38-horsepower model 124-mm. bore by 150-mm. stroke. The lengthening of the stroke is thus most pronounced in the smaller models. These are also equipped with worm drive. The clutch in all of them is of the leather-faced cone type.

In Pipe cars an effort has been made to remove all possible causes of noise and vibration. Stub shafts have been abolished, even that usually carrying the reverse pinion in the gearbox. The camshaft mechanism is actuated by silent chain, the magneto by miter wheels. The water circulation is thermic, without pump and with large pipes. The dimensions of the crankshaft have been increased in accordance with recent improved practice. The foot brake acts on the wheel drums and the hand brake on the differential shaft housing.

The Herstal, or F. N. cars (Fabrique Nationale d'Herstal), in whose manufacture special and automatic machinery is employed on the American plan to secure perfect interchange-



The 90-H.P. Mercedes Touring Car Shown at Brussels—Left Front and Right Rear Views

ability of parts more extensively than in other European factories, include a 16-25-horsepower chassis, in which the four-cylinder motor is cast *en bloc* with offset crankshaft and a single camshaft. A disk clutch mounted self-adjustingly by means of a universal joint is specially designed to secure equal wear and a very gradual engagement of this member.

The long stroke is found again in the three models of the Nagant. The dimensions of the bores and strokes are, respectively, 70 by 118, 90 by 120 and 106 by 130.

One new feature is attracting especial attention in the S. A. V. A. models. This is the adoption of miter gears for the change-gearbox, by which means vibration should be avoided at all speeds. The control of the valves is by silent chain. Monoblock cylinder casting, valves on one side with one set above the other, twin spark ignition and valve control by silent chain are among the other features. One of these cars with a four-cylinder motor of 82-mm. bore by 140-mm. stroke has repeatedly been tried out at a speed of 100 kilometers per hour, and is said to hold the road well at this speed, despite its relatively small weight.

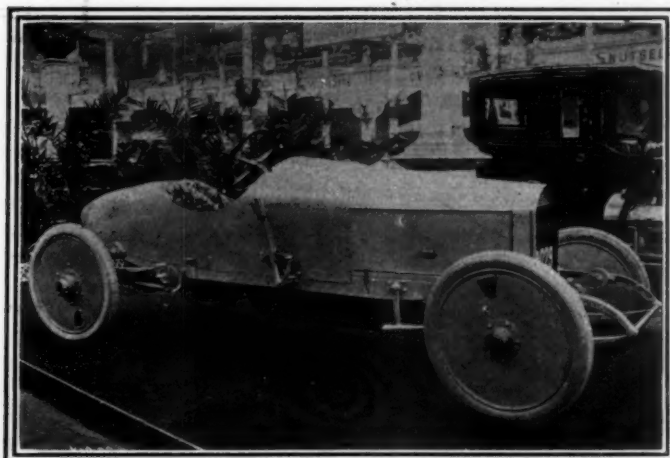
The 90-horsepower Mercedes touring car, which is shown in two of the accompanying illustrations, with its inboard control and outboard exhaust pipes, its disk wheels, incased chain drive, elaborated spare tire rests, straightened and abbreviated rear fenders and triangulated radiator, more pointed than that of the Métallurgique, would have drawn the gaze of visitors and the inquiry of designers anywhere and stands as an elegant example of radicalism in forms blended with conservatism in those features whose value is never demonstrated till they have been in operation in the hands of the public for a number of years.

In the Opel 30-40-horsepower limousine there will be noticed a pleasing effect in the running board produced by the simple

means of running the brackets on the outside of the valance, and a certain striking effect is obtained in the carriage body by harmonizing the rounded rear corners of the window frames with the contours of the vehicle. By contrast, the Herstal limousine, with its sharp-drawn rear contour, thin roof and wire wheels, suggests a lightness pleasing to other tastes and preferences.

The 12-horsepower Springuel sporting car, made by the consolidated Springuel and Imperia companies, fittingly exploits the racing victories gained by both these firms in the "Coupé de Meuse" events of 1909 and 1910. Its combination of low power and price with racing lines seems to speak of a certain clientèle for cars of this type which may scarcely be found in the United States. The little Adler torpedo, from Germany, on the other hand, does not fail to remind one of its American prototypes and of the fact that Germany in many instances has seen the value of equipping small and low-priced cars with relatively high motor power, in which respect the reasonable fuel prices which Germany enjoys may have been of influence.

Brasier, of France, once among the great firms in the racing field, exhibits a pie wagon, or what corresponds to this utility, which would be the envy of any American delivery boy. The amount of space and dignity given over to the motor and driver, to say nothing of an extra seat for a collector, would be more than an offset for small wages, and the ensemble should please the pastry-eating householders before whose habitations the vehicle would make its daily stops. Its lines and finish are somewhat similar to those of a handsome closed car, such as may be seen any day drawn up before the portal of a chateau or of a Paris mansion. Though only a pie wagon, it is at least a pie wagon *de luxe*, and its general appearance goes a long way toward increasing the dignity of the profession.



Springuel-Imperia 12-H.P. Sporting Car



The Brassier Pastry Delivery Wagon



Battery of Maxwell cars leaving Tarrytown factory for test on Hudson

LEXINGTON REPRESENTED IN BOSTON—The Lexington is now marketed in Boston, Mass., by a new company with A. T. Nichols as manager. Salesrooms have been secured at 1020 Boylston street.

McKeough with the Velie—J. K. McKeough has accepted a position with the Velie Chicago branch in the truck department.

Kellogg Branch in New York—The Kellogg Manufacturing Company has opened a New York office in the Buick building, 1733 Broadway.

Buick in Carroll County, Md.—J. W. Lockhard & Sons, of Westminster, Md., have been named as Carroll County representatives for the Buick car.

National Represented in York—T. S. Pfeiffer, 323-25 East Market street, York, Pa., has taken the agency for the line of the National cars for 1912.

Best Promoted by Republic Company—T. P. Best, New England manager of the Republic Rubber Company, has been called from Boston to the factory at Youngstown, O., to assume a more responsible position.

Scouten Manager of Velie Branch—H. C. Moore, who has been the manager of the Atlanta, Ga., Velie branch, has resigned and E. S. Scouten has been named as his successor and is in charge of the Atlanta office.

O'Neil Company Opens Boston Agency—The O'Neil Tire Protector Sales Company has opened an agency in Boston, Mass., in the Boston Motor Company garage on Ipswich street, and James Waters is in charge of it.

Apperson Agency Opened—An agency for the Apperson has been opened at 427 North Meridian street, Indianapolis, Ind., by Herbert Lytle, who is prominent in racing circles and who has driven the Apperson and American cars in many events.

Harris Joins Henderson Forces—E. F. Harris, formerly assistant sales manager for the Motor Car Manufacturing Company, Indianapolis, Ind., has taken a position with the sales department of the Henderson Motor Sales Company, of the same city.

Highway League in Boston—The Highway Safety League is the latest organization to be formed in Boston, and it was launched this week following two months of agitation on the part of the promoters, several of whom are prominent in public life in Boston.

Opens Boston Branch—The Aristos Company is now represented in Boston by Miller & White, and salesrooms have been opened on Boylston street. Harry Grant has been secured to demonstrate the Disco self-starter and Mondex shock absorber for the firm.

Dub Returns to Buick Branch—Jacob Dub, for years with the Atlanta, Ga., Buick branch as city salesman, but more re-

cently traveling for the Studebaker corporation in the interest of the Flanders, has returned to his original position with the Buick branch.

Springfield Sales Company Organized—The Springfield Auto Sales Company, of Springfield, Ill., has just organized as successor to the Boulevard Garage Company and the Springfield Garage Company, with temporary headquarters 106-108 East Washington street.

Jeffery Dewitt Branch Opened in New York—On account of the greatly increasing business of the Jeffery Dewitt Spark Plug Company, of Detroit, that concern has opened a New York office at 1789 Broadway, from which branch the Eastern business will be handled.

New Buick Agency in Waukesha, Wis.—Ed. J. Christoph and John V. Atkin have formed a partnership at Waukesha, Wis., under the name of Waukesha Auto Company, to handle the Buick line and operate a garage and repair shop. Temporary quarters are at 604 Martin street.

Des Moines Garage Men Organize—The garage owners of Des Moines this week organized the Des Moines Garage Association, the purpose of which is to establish uniform prices for storage and labor, and in general to promote the best interest of the garage and accessories men of the city.

Hawley Goes to Boston—Phillip B. Hawley, who has been closely identified with the manufacturing end of the motor industry for several years in Detroit, has been sent to Boston to take charge of the Boston branch of the Studebaker corporation. He will look after the wholesale business throughout New England.

Republic Company's New Building—The Republic Rubber Company of California, a newly established branch of the Republic Rubber Company, of Youngstown, O., has recently occupied one of the handsomest tire buildings of San Francisco. The location is Golden Gate avenue and Hyde street in the well-established automobile district. The building is of two stories and basement, and is handsomely finished.

New Garage for Edison Company—Work upon plans for a new garage to be used by the Edison Electric Illuminating Company of Boston was begun a few days ago by the Stone & Webster Engineering Company. The company recently bought a large tract of land for the purpose and a one-story brick and concrete building with floor space large enough to accommodate more than 150 vehicles will soon be built.

Remy Official Promoted—Harry W. Griffith, of Indianapolis, Ind., who has been secretary-treasurer of the Remy Electric Company, Anderson, Ind., since that company was taken over by interests represented by Stoughton A. Fletcher, has been advanced to the position of general manager. He succeeds W. R. Poland, who has resigned, and who has become affiliated with an Anderson concern manufacturing a self-starting device.

O'Neil Company to Open a Branch in Chicago—The O'Neil Tire & Protector Company has decided to establish a branch in Chicago.

Findlay Dealers to Sell Hupp-Yeats Electrics—Collingwood & Edwards, of Findlay, O., have taken the agency of the Hupp-Yeats car in this territory.

Edge to Study South African Field—S. F. Edge, the well-known English automobile authority, is en route to South Africa, where he will study conditions in that line.

Stoddard-Dayton Agency at Darnestown—The agency for the Stoddard-Dayton car in Carroll County has been placed with W. M. Haines, whose headquarters are at Darnestown, Md.

Sweet to Manage Eureka Company—W. D. Sweet, formerly manager of the Court Square Garage, Scranton, Pa., has been appointed manager of the Eureka Motor Car Company of that city.

Dodson Reinforces Baltimore Buggy Top Company—F. J. Dodson has joined the sales force of the Baltimore Buggy Top Company. He was formerly connected with the Babcock Company.

Pullman Car Handled in Maryland—The Model Auto Company has taken the Pullman agency and will have jurisdiction over this district, which embraces Baltimore and the State of Maryland.

Elmore Represented in Omaha and Vicinity—George Rogers, of Omaha, Neb., has taken the agency for the Elmore car, having as territory western Iowa, South Dakota and Nebraska.

Schacht to Be Represented in Syracuse—John D. Quinlan, of Jamesville, N. Y., and E. G. Coe, of Syracuse, N. Y., have formed a partnership to handle the Schacht pleasure and commercial cars in that territory.

Alco Is Represented in Wisconsin—The Franklin Auto & Supply Company, Fourth and Prairie streets, Milwaukee, Wis., state agent for the Franklin and Regal, has been appointed state representative of the Alco.

New Velie Agencies in New England—Frank Mitchell, of Waterville, Me., has taken the agency for the Velie car in that city and vicinity and Tucker & Palmer, of Tariffville, Conn., are to handle the Velie in their locality.

Shaffer Company to Distribute R. C. H. in Maryland—The Shaffer Manufacturing Company, of Baltimore, Md., is the representative for the new R. C. H. car. The company will be the state distributor for the new line.

Madison to Sell Mitchell in Baltimore—The Madison Motor Car Company has the agency for the Mitchell car in Baltimore and vicinity. H. P. Shuler, who has joined the sales force of the company, will have charge of the agency.

Moline Automobile Company Increases Capital—The Moline Automobile Company, of Moline, Ill., has increased its capital stock from \$100,000 to \$500,000, the amendment to the articles of incorporation stating that the increase was to care for general increase in business.

Midland to Open Branch in Chicago—The Midland Motor Company, of East Moline, Ill., has leased 2009 Michigan avenue, Chicago, as headquarters for the Chicago branch, which will shortly be established there. C. G. Wilson, former secretary of the Chicago Motor Club, will be in charge.

Brockton to Have Automobile Show—The automobile dealers of Brockton, Mass., are to hold an automobile show at the Palace Rink in that city on Thursday, Friday and Saturday, February 8, 9 and 10.

New Company to Handle Apperson in New York—The Apperson Motor Car Company, of New York, has been formed to sell Apperson automobiles in the Metropolitan district. These products were formerly handled by the Sydney B. Bowman Automobile Company, New York agents for the Marmon car.

Archambault Buys Agency—The Lozier Motor Sales Company, of Milwaukee, Wis., has been purchased by Frank J. Archambault, who has organized the Archambault Motor Sales Company, and will continue the agencies for the Lozier and Michigan cars at 199-201 Ogden avenue, Milwaukee.

Brockton to Have Automobile Show—The automobile dealers of Brockton, Mass., are to hold an automobile show at the Palace Rink in that city on Thursday, Friday and Saturday, February 8, 9 and 10. It is expected that there will be no difficulty in disposing of the space. Accessories will also be shown.

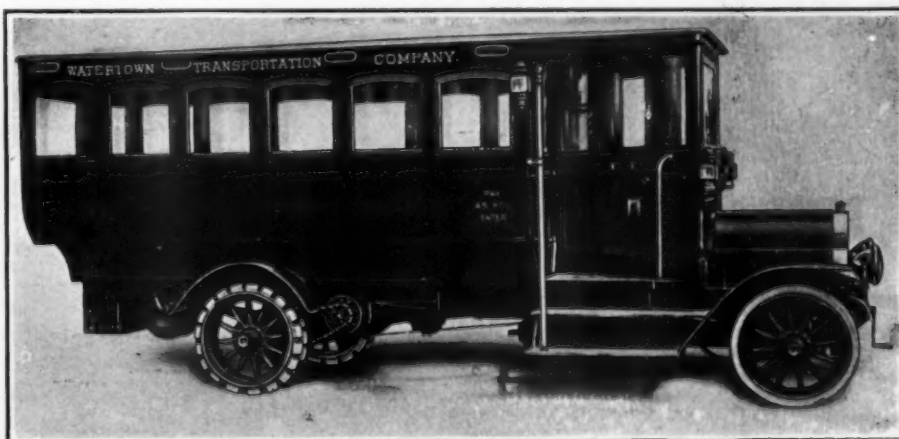
Nadall Sales Manager of Cino—Berne Nadall, recently connected with the Findeisen & Kropf Manufacturing Company, has become sales manager of Haberer & Company, manufacturers of Cino cars. This company intends to increase its output this year and to eventually devote its energies entirely to the making of trucks.

New Knox Bus Line—Three new Knox motor buses are in operation in Watertown, N. Y. Each carries twenty-eight passengers. The driver collects fares and regulates the temperature and electric lighting of the bus from the separate vestibule which he occupies in front. Push buttons notify when a passenger wishes to stop.

A. M. McCormack Here to Study Conditions—Arthur McCormack, managing director of the Wolseley Tool & Motor Car Company, of Birmingham, England, arrived in this country last week. During his sojourn of a month he will make a study of American shop practice and will pick up any ideas which may be of service to the company which he represents.

Wood to Superintend Midland Plant—Frank B. Wood, formerly on the executive committee of the Chicago Motor Club and experienced in the construction, racing and sales departments of the automobile business, has accepted the position of superintendent of the Midland Motor Company plant at East Moline, Ill. Mr. Wood acted as temporary superintendent for a short time, succeeding Henry Pope, who lately resigned.

Changes in Emil Grossman Company's Force—C. P. Townsend, formerly Western manager of the Emil Grossman Company, of New York, and who has been with the Westchester Appliance Company, has again taken charge of that territory. C. A. Mattison, formerly in charge of the New England territory of the company and recently with the Jacobson-Brandow Company, of Pittsfield, Mass., has resumed his position with the Grossman company. L. G. Hartdorn, recently with the American Ever-Ready Company, will cover the States of Michigan and Indiana.



One of the Knox Pay-as-you-enter Buses at Watertown, N. Y.

Detroit to Be Distributed from Milwaukee—The Oakland-Wisconsin Motor Company, 215 Wisconsin street, has taken the state agency for the Detroit in Wisconsin.

New Agencies in Montreal—The Silent King automobile is now represented in Montreal, Que., by Frigon & Baker, while the St. Louis Garage has the local agency for the Cutting car.

Barnwell Joins Barnett Forces—S. E. Barnwell, formerly of the Denver, Colo., Studebaker agency, has taken a position with W. W. Barnett, Alco and Stoddard-Dayton representative.

Conkling Takes Elmore Agency in Syracuse—H. B. Conkling, of Syracuse, N. Y., has taken the agency for the Elmore two-cycle car and the agency will be located at No. 411 Conkling street.

Motor Institute in Milwaukee—The Northwestern Motor Institute has been established in Milwaukee and is located in connection with the Milwaukee Staver branch at 228-232 Wisconsin street.

New Idaho Company to Handle Everitt—Messrs. Carssow and Herrin, of Lewiston, Idaho, have secured the agency for the Everitt cars in Central Idaho. The new concern will be called the Lewiston Auto Company.

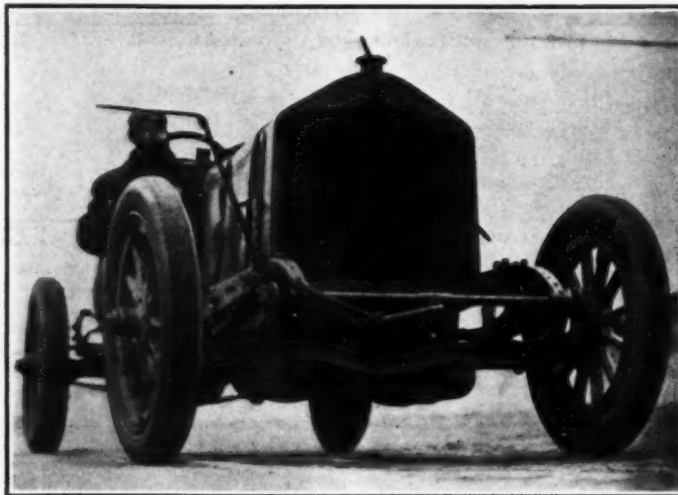
Lampshire to Sell Everitts in Oregon—James J. Lampshire of Burns, Oregon, has closed an agency contract for Harney County with the Everitt Northwest Company. Mr. Lampshire is proprietor of the Lampshire Garage, the pioneer garage of Harney county.

New Salesroom at Case Syracuse Plant—The J. I. Case Threshing Machine Company is fitting up a new salesroom at its plant in Syracuse, N. Y., for the display of six 1912 models of the Case car. The concern's product includes 30 and 40-horsepower cars with all types of bodies.

George Grede & Brother Company Supplants Studebaker Branch—The Milwaukee branch of the Studebaker Corporation, of Chicago, has been superseded by the George Grede & Brother Company, of 244-250 Reed street, Milwaukee, at which location the E-M-F and Flanders business will be carried on.

Grossman Company Has Toronto Agency—B. A. Hall, formerly of the firm of Hall & Thomas, Vancouver, B. C., has formed a company under the name of the Hall Motor Supplies Company, 141 King street, East, Toronto, Ont., Canada, to represent the Emil Grossman Company, of New York and Detroit.

Wilson to Manage Oakland Works—Thomas W. Wilson has been appointed works manager of the Oakland plant at Pontiac. Mr. Wilson has had many years' experience with motors and knows the production end of the business thoroughly. Before going with the Oakland Motor Car Company, he was general superintendent of the Fiat works at Poughkeepsie, N. Y.



Wilcox Tuning Up National on Indianapolis Speedway

Franklin Promoted by Regal Motor Sales Company—George W. Franklin has been appointed manager of the Regal Motor Sales Company, of Detroit, and manager of the entire Michigan district, with headquarters in the Regal salesrooms on Woodward avenue. Mr. Franklin has traveled in the interests of the Regal Company since its inception and has built up a big acquaintance in the state.

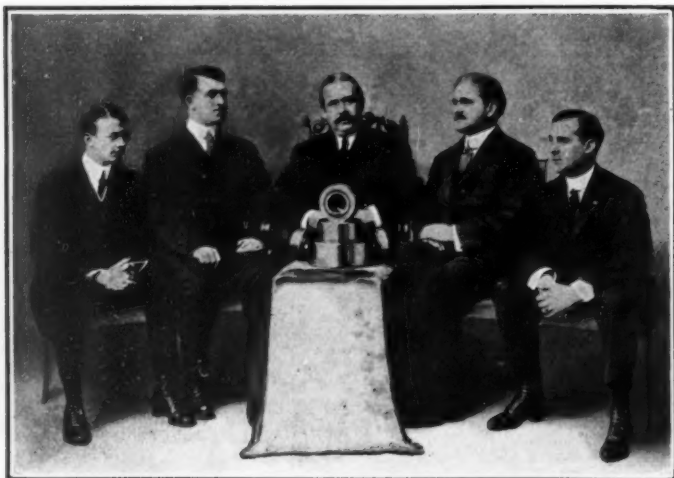
Milwaukee Club to Publish Paper—Plans are being made by the Milwaukee Automobile Club for the issuance of a monthly newspaper in bulletin form, similar to the publications of motor clubs in Chicago, Buffalo and other cities. The club is growing rapidly and the need for a medium has become not only desirable but pressing. According to present plans, the editorial management will be placed in the hands of Leonard E. Meyer, secretary of the club and a well-known newspaperman.

Jackson & Wood Manufacturing Company Reorganized—The Jackson & Wood Manufacturing Company, of Denver, Colo., has been reorganized as the Wood-Wight Manufacturing Company, Inc., and is located in the quarters formerly occupied by the Hupp Branch at 1616-1620 Broadway. The members of the firm are: O. E. Wood, Mark Wight, and Sidney G. Waller. They will engage in the manufacture of Jackson & Wood electric lights for automobiles and a self-starter of their own patent.

Griffith General Manager of Remy Company—Harry W. Griffith, who has been the secretary-treasurer of the Remy Electric Company, Anderson, Ind., since Stoughton A. Fletcher bought the plant last February, has been appointed general manager of the company, vice, W. R. Poland who has resigned. Mr. Griffith has had a long experience in the manufacturing business, having been connected with the American Creosoting Company, of Chicago, before coming to Anderson. Mr. Poland will affiliate with a new company, which has been organized in Anderson for the manufacture of self-starters for automobiles.

White Service Building in Operation—The White Company's new service building, located on West Fifty-seventh street, between Eleventh and Twelfth avenues, New York, has just been completed, and is now in full operation. The building, while having 25,000 square feet of floor space, is only one story high, thereby eliminating elevators and the congestion and delay which necessarily prevail when a service building has small ground area but is several stories in height. Another very commendable feature of the construction is the total absence of all posts and pillars, the roof being supported by trussed spans. There are completely equipped machine, blacksmith, carpenter and paint shops, and a stockroom.

Sanford-Herbert Company Makes Big Sale—The Sanford-Herbert Motor Truck Company, of Syracuse, N. Y., reports what is claimed to be the largest single sale of trucks ever made to any one concern in the purchase of 325 trucks by the



New Departure Quintet at Chicago Show—J. J. Jennings, Fred. R. Hughes, DeWitt Page, S. B. Dusenberre, J. R. Ide

Atlantic Motor Truck Company, of New York, to be delivered as fast as built. The sale is reported to represent \$487,500.

Detroit Electric Handled by Omaha Concern—Andrew Murphy & Son have taken the Omaha agency for the Detroit Electric. John Power, of Detroit, has come to Omaha to take charge of the pleasure car end of the business.

New Company to Represent S. G. V. in the Capital—The Marshall-Parsons Company has been formed to handle the S. G. V. in Washington and vicinity. Salesrooms are at 1315 H street.

Regal Changes Hands in Washington—The Regal agency has been transferred from Emerson & Orme to the Hudson Sales Agency, 1012 Fourteenth street, Washington, D. C. Both pleasure and commercial cars will be handled by the new agency.

Road Race to Be Held in Arizona—Arrangements are being made to hold a road race from Tucson to Phoenix, Ariz., a distance of 120 miles over desert and valley roads, at an early date. A silver loving cup and cash prizes will be offered.

Buick and Apperson Agents Move to Phoenix—Ferguson, Raub & Company, Arizona agents for the Buick and Apperson, have moved their headquarters from Bisbee to Phoenix. The Bisbee establishment will be maintained as a branch.

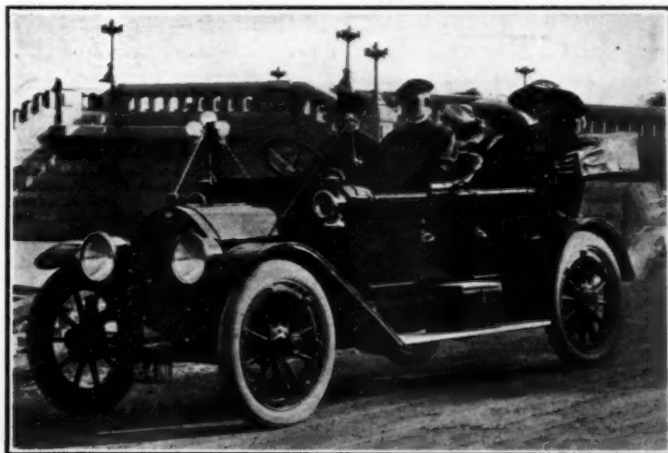
Canadian National Association Organized—The Canadian National Automobile Association has been formed in Toronto, Ont., and will operate throughout the Dominion, the same as the American Automobile Association does in the United States.

Sohner to Superintend Velie Construction—E. H. Sohner, formerly with the Packard, Oldsmobile and other automobile concerns with several years' experience in the motor construction business, has accepted the position of superintendent with the Velie Motor Vehicle Company, of Moline, Ill., and will have charge of general construction.

New Service Garage of Overland-Syracuse Company—J. W. Lee, manager of the Overland-Syracuse Company, announces the establishment of a new service garage at 311 West Willow street, Syracuse, N. Y. A long lease has been taken of a two-story brick building and the work of equipping it for an up-to-date service garage will at once be started.

Garford's New Representative in Washington—The Garford Motor Vehicle Company, of Washington, D. C., has been formed by R. C. Smith, president, and Charles T. Felter, vice-president and treasurer. The new company will handle the Garford line of pleasure and commercial cars and will be located at 829 Fourteenth street. A service department will be established in the near future.

New Garage and Salesroom for Omaha—The recently incorporated Drummond Motor Company, of Omaha, Neb., will start work at once on a three-story garage and salesroom at Twenty-sixth and Farnam streets. The building will be of steel and pressed brick, and will cost \$50,000.



1912 Marmon five-passenger 32-horsepower touring car

Automobile Incorporations

AUTOMOBILES AND PARTS

ATLANTA, GA.—Interstate Automobile Tire & Rubber Company; capital \$500,000; to manufacture and deal in automobile tires and accessories. Incorporators: R. H. Falbaum, M. A. Gentry, D. R. Strauss.

BROOKLYN, N. Y.—Rockmore Motor Company; capital \$5,000; to engage in the automobile business. Incorporators: G. F. Morrison, W. R. Herrick, P. W. Carney.

CLEVELAND, O.—Goby Engine Company; capital \$100,000; to manufacture automobile engines and parts. Incorporators: C. Gird, R. A. Connally, W. K. Clymer, M. J. Moskoff, E. Feazel.

CLEVELAND, O.—Winton Gas Engine & Manufacturing Company; capital \$200,000; to manufacture all kinds of automobile engines. Incorporators: A. Winton, J. Winton, W. S. McKinstry, L. Winton, S. Parks.

DAYTON, O.—Imperial Auto Sales Company; capital \$10,000; to operate a sales agency for automobiles. Incorporators: R. W. Meyers, W. A. White, A. J. Fiorini, R. F. Myers, T. E. Korstetter.

DETROIT, MICH.—Church-Field Motor Company; capital \$150,000; to manufacture automobiles. Incorporators: A. Church, C. H. Hecker, H. G. Field.

EVANSVILLE, WIS.—Frost Engine Company; capital \$20,000; to manufacture and sell automobile engines. Incorporators: F. S. Frost, C. J. Pearsall, T. C. Richardson, W. H. Johnson, A. E. Durner.

DOVER, DEL.—Rowan Automobile Company; capital \$5,000; to buy and sell automobiles, accessories and supplies. Incorporators: L. Isenberg, D. Isenberg, O. Isenberg.

HARTFORD, CONN.—Connecticut Commercial Car Company of Hartford; capital \$50,000; to manufacture automobile trucks. Incorporators: J. J. Rafter, G. L. Kallberg, J. B. Henry.

GREENWICH, CONN.—Adams Gas Engine Company; capital \$50,000; to manufacture gas engines of all kinds. Incorporators: C. F. Waterbury, H. Weed, W. A. Adams.

MASON, O.—John Kohl Carriage & Automobile Company; capital \$10,000; to manufacture carriages and automobiles. Incorporators: J. Kohl, G. Kohl, A. H. Bennett, G. A. Moon, F. Ward.

NEW YORK CITY.—Apperson Motor Car Company of New York; capital \$10,000; to deal in automobiles. Incorporators: F. A. Gramsack, H. H. Cannon, M. C. Gramsack.

NEW YORK CITY.—Franklin Motor Car Company; capital \$10,000; to deal in automobiles. Incorporators: G. A. Tisdale, A. F. Aird, M. G. MacDonald.

NEW YORK CITY.—Transportation Sales Company, Inc.; capital \$550,000; to deal in automobiles, motor vehicles, etc. Incorporators: H. W. Webb, J. L. Breese, Jr., A. de Magnin.

PORT CHESTER, N. Y.—Jencick Motor Corporation; capital \$100,000; to manufacture automobile motors, etc. Incorporators: D. J. Daly, P. L. Schanze, I. W. Dimelow.

ROME, GA.—Automobile Supply Company; capital \$5,000; to deal in automobile accessories and supplies. Incorporators: L. M. Wright, J. Gardner.

SPARTANSBURG, S. C.—R. H. Nesbitt Automobile Company; capital \$10,000; to engage in the automobile business. Incorporators: R. H. Nesbitt, W. D. Nesbitt.

TACOMA, WASH.—Alaska Hydraulic Motor Company; capital \$10,000; to manufacture motors, etc. Incorporators: T. F. Palms, D. T. Peck.

TULSA, OKLA.—Standard Motor Car Company; capital \$5,000; to deal in automobiles, motor cars and supplies. Incorporators: W. L. Walker, W. S. Baker.

GARAGES AND ACCESSORIES

AUSTIN, TEX.—Capital City Automobile Company; capital \$35,000; to deal in automobile goods and supplies. Incorporators: P. Bremond, W. M. Graham, H. J. Grinnan, R. M. Thompson, Jr.

BATH, ME.—Bath Garage Company; capital \$10,000; to deal in automobiles, motor vehicles, etc. Incorporators: C. W. Clifford, Jr., and others.

BROOKLYN, N. Y.—Reliable Garage Company; capital \$5,000; to conduct an automobile garage. Incorporators: A. R. Doerle, R. M. Myers, G. M. Millar.

BUFFALO, N. Y.—Bison Rubber Company; capital \$5,000; to manufacture automobile tires. Incorporators: J. R. Heintz, C. W. Heintz, R. B. Bernard.

BUFFALO, N. Y.—Buffalo Auto Novelty Company; capital \$500; to deal in automobile accessories. Incorporators: G. A. Orr, D. S. Carroll, H. L. Jauch.

BUFFALO, N. Y.—Centaur Manufacturing Company; capital \$35,000; to manufacture automobile accessories. Incorporators: A. Schmidt, B. Schmidt, J. E. Barry.

CINCINNATI, O.—D. M. Cooper Company; capital \$10,000; to manufacture engines and automobile accessories. Incorporators: H. L. Hagerman, C. E. Dornette, W. H. Mitchell, W. E. Kampfmueller, G. A. Dornette.

CLEVELAND, O.—Motor Supply & Tire Company; capital \$1,000; to handle all kinds of automobile tires and supplies. Incorporators: E. G. Gargett, R. C. Gargett, R. Holbrook, D. Pfahl, R. J. Bissett.

COLUMBUS, O.—Ohio Punctureless Tire Company; capital \$50,000; to handle automobile tires of all kinds. Incorporators: E. O. Pettit, W. Moore, C. N. Bowen, H. E. White, J. F. White.

DOVER, DEL.—Dahl Punctureless Tire Company of Delaware; capital \$50,000; to deal in automobile tires. Incorporators: G. G. Stiegler, G. D. Hopkins, G. W. Dillman.

GLASGOW, KY.—Devney Automobile Company; capital \$50,000; to deal in automobile goods. Incorporators: R. S. Devney, W. H. Jones, J. S. Cable, J. R. White.

GRAND RAPIDS, MICH.—Auto Axle Company; capital \$24,000; to manufacture automobile accessories. Incorporators: P. A. Jones, A. Walther, L. M. Jones.

GRAND RAPIDS, MICH.—Panwood Manufacturing Company; capital \$60,000; to manufacture and deal in automobile accessories. Incorporators: F. Z. Pantlind, H. B. Woodcock, R. G. Woodcock.

MILWAUKEE, WIS.—Wisconsin Auto Fender & Manufacturing Company; capital \$15,000; to manufacture and deal in automobile accessories and supplies. Incorporators: G. L. Sexton, B. S. Elliott, L. Born.

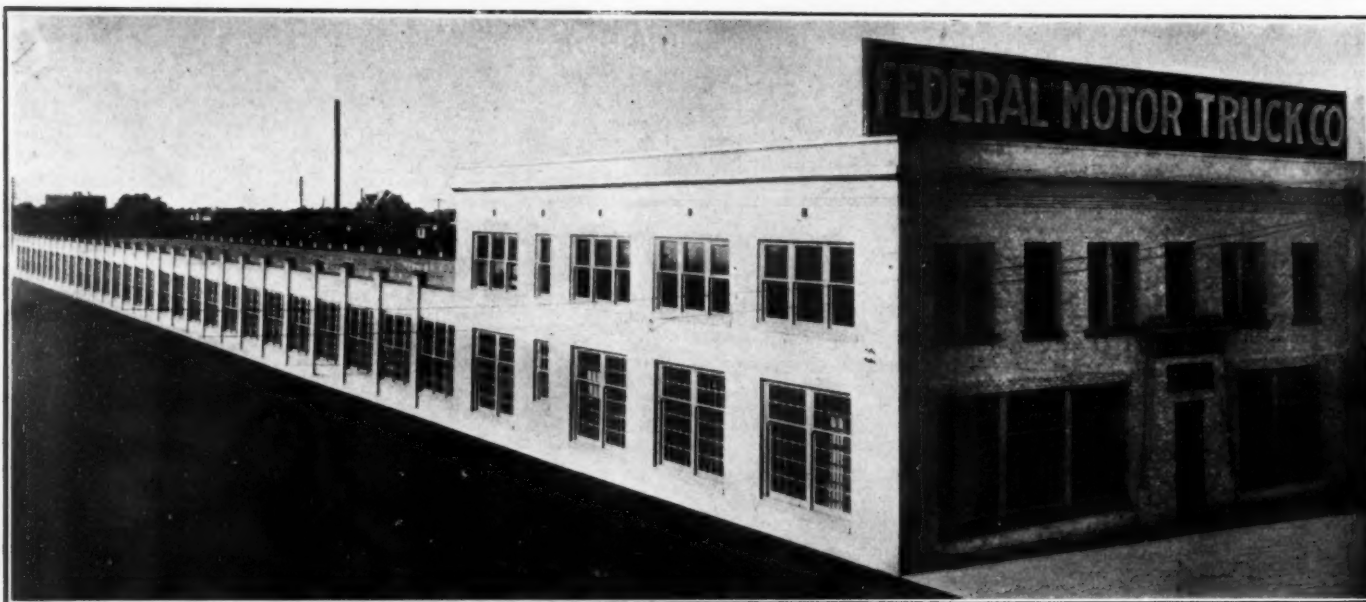
NEW YORK CITY.—Sixty-sixth Street Garage Company; capital \$5,000; to conduct an automobile garage. Incorporators: H. S. Austin, E. Corr, J. W. Collopy, Jr.

NEW YORK CITY.—Troy & Woodhouse, Inc.; capital \$5,000; to deal in automobile accessories and supplies. Incorporators: T. A. Troy, H. S. Woodhouse, J. S. Woodhouse.

PLAINFIELD, N. J.—Allen B. Laing Company; capital \$20,000; to manufacture and deal in motors and electrical machinery. Incorporators: A. B. Laing, I. M. Laing, G. F. Graves, A. V. Searing, E. M. Laing.

TROY, O.—Troy Rubber Tire Company; capital \$10,000; to manufacture and deal in rubber and metal tires and wheel appliances. Incorporators: J. Schweigert, C. S. Petry, S. LeBlond, C. M. Drake, A. V. Kiser.

OF INTEREST *to the* INDUSTRY



New Factory of the Federal Motor Truck Company at Detroit, Mich.

FEDERAL TRUCK COMPANY OCCUPIES NEW PLANT—For the third time in the history of the company the Federal Motor Truck Company, of Detroit, Mich., has been obliged to seek larger quarters. The company is at present moving into its new factory, formerly the plant of the Van Dyke Motor Car Company, situated on the Michigan Central, Wabash, Lake Shore and Grand Trunk railways. Sidings from the Michigan Central and Wabash extend to the property. The building shown above is 512 feet by 60 and the ground owned by the company is 800 by 200 feet, giving room for the erection of two more buildings of the same size. Besides the building shown there are now on the property warehouses, test sheds and a large power plant. The combined equipment of the new factory will have a capacity of 1,000 trucks a year.

Day Company to Enlarge Works—The Day Automobile Company, of Detroit, Mich., is planning the erection of extensive additions to its plant. The new building will probably be begun sometime in the spring.

Truck Company to Have New Factory—The Windsor Truck Company, of Windsor, Ont., has let contracts for the erection of a large factory for the manufacture of automobile trucks.

Trucks to Be Added to List of Springfield Products—The Springfield Autotruck Company, of Springfield, Ore., has completed plans for the erection of a plant for the manufacture of commercial cars. Welby Stevens has been made president of the company.

Carriage Company to Invade Canada—The Jewel Carriage Company, of Carthage, O., is preparing to build a branch in Canada, near the American border to manufacture automobiles for the Canadian market. C. F. Pratt is president of the company.

Business Good for Waukesha Company—The Waukesha Motor Company, of Waukesha, Wis., has so many orders on its books that it has been obliged to run on a day and night schedule. Another addition will probably be built in the early spring.

Plant for Galion Possible—Prospects are very bright for the establishment of a plant at Galion, O., for the manufacture

of motor trucks, according to the statements made by the leading citizens. President H. W. Woodward and Secretary W. M. Hager, of the Cleveland Motor Truck Company, are negotiating for the consolidation of that corporation with the Howard Motor Car Company, of Galion. If the negotiations are successful work will be begun in the near future.

American Company Takes Up Worm Drive—Coincident with the return from Europe of W. C. Baker, president and mechanical engineer of the American Ball Bearing Company, of Cleveland, O., announcement is made that the company has supplemented its present product by the addition of a complete line of worm-driven axles, in which the imported type of Lanchester-Daimler worm and worm wheel is to be used.

Pittsburgh to Have Big Truck Factory—Announcement has just been made of Pittsburgh's first important automobile factory. The H. Lange Wagon Works, builders of wagons for 40 years, have organized a subsidiary company known as the Lange Motor Truck Company, and have erected a new concrete factory with an area of 40,000 square feet, equipped it completely and entered upon the manufacture of 100 motor trucks as the first season's output. The following year's production will probably be even larger.

Automobiles to Be Made in Chattanooga—The necessary capital having been subscribed for the location of an automobile factory here, men and machinery are beginning to come from the Nyberg factory at Anderson, Ind., to put things in readiness for the manufacture of cars on a large scale. The Nyberg Automobile Works have taken a large part of the capital stock but the Chattanooga plant will be operated as entirely separate from the Anderson works, being in the hands of a different company.

Velie to Occupy New Truck Factory—The new truck factory of the Velie Motor Vehicle Company, at Moline, Ill., will be occupied within a few weeks and will form the headquarters of the truck branch of the Velie plant. New machinery has been installed and the plant will be in operation within a short time. Motor parts as well as parts of pleasure cars will be manufactured at the new factory building and assembled at the central plant. The new building is 400 by 100 feet and one story in height.

PATENTS GONE TO ISSUE

FLYWHEEL.—A sleeve engaging a shaft and carrying a flywheel.

The flywheel this patent refers to is the combination of a shaft carrying an enlargement and a washer secured to its end, with a sleeve which fits between the enlargement and the washer and comprises three stepped portions. A flywheel has its flat hub arranged on the intermediate portion of the sleeve, a ring fitting on the smallest portion of the intermediate sleeve portion. Bolts are used to draw the ring toward the sleeve, and there are provided means for engaging the sleeve to the enlargement of the shaft.

No. 1,015,476—to William L. Clouse, Tiffin, Ohio. Granted, January 23, 1912; filed October 19, 1910.

Speed-Changing Mechanism.—A transmission gearset of the planetary type.

2. The speed-changing mechanism, Fig. 1, consists of an aligning driving and driven member, combined with a planetary gearset. This gearing comprises a stationary gear concentrically arranged on the axis of rotation of the members mentioned, a gear which is connected with the driving member, a gear connected with the driven member and gears of different diameter connected together and working on a common axis of rotation. One of the last-named gears meshes with the gear on one of the two members and with the stationary gear, while the other one of the last-named gears engages with the gear arranged on the other member. Additional gear mechanism operating in conjunction with the planetary set balances the entire force exerted between the driving and driven members.

No. 1,015,477—to William C. Conant, Riverside, Ill. Granted January 23, 1912; filed March 4, 1911.

Magneto.—A system of arranging the pole pieces in the casing.

5. The magneto casing, Fig. 3, is formed of sections, each of which has semi-cylindrical extensions at each end and is provided with an internal longitudinal rib. This rib forms an abutment for the pole piece, and magnets are used to bind the pole pieces in place, caps being adapted to inclose the extensions and to hold them together.

No. 1,015,623—to Sherman L. Kelly, South Bend, Ind. Granted January 23, 1912; filed May 5, 1910.

Clutch Mechanism.—A friction-type of design.

4. This patent, Fig. 4, combines the following elements. A body part is substantially cylindrical in form, being a shell which

has pockets extending parallel with the axis of the shell. In these pockets there are friction clutch pins urged by springs tending to force the pins from the pockets. A gear located in the shell and adjacent to the pocket outlets has grooves for receiving the pin ends, and a cover engages one end of the shell to lock the gear within the shell and to hold it against the pin ends. There are driving means provided for the shell and driven parts are connected to the gear within the shell.

No. 1,015,394—to Herbert S. Mustin, assignor to the Austin Manufacturing Company, Chicago, Ill. Granted January 3, 1912; filed December 6, 1909.

Creeping and Anti-Skidding Device.—A ring with suitable members to prevent skidding of the tires on the automobile wheel.

2. This patent refers to an automobile wheel having the usual rim and tire. On the wheel spokes and adjacent to the rim an oscillating ring is mounted in bearings; a pin projects laterally from the ring, socket bearings extending in the same direction. A series of spurs with heads having ball portions adapted to enter the sockets are arranged so as to be capable of projection beyond the tire circumference. A series of links connects spurs and ring mentioned; headed pins penetrate the heads of the spurs and their socket bearings, a resilient member being mounted between each spur and pin head. Thereby the spurs are allowed a flexible lateral movement, and a second resilient member engages each spur head, being adapted to hold the spurs in a set position. Means for shifting the ring to rock the spurs to and from operative positions are incorporated in this apparatus.

No. 1,015,545—to William S. Craig, St. Mary's, Ohio. Granted January 23, 1912; filed December 7, 1910.

Combined Tire and Trunk Holder.—Device for securing these accessories to the body of an automobile.

1. The subject matter of this patent is a tire holder, comprising a base block provided with a laterally projecting socket. From the inner side of the holder rises a lug. An angled lock bar has one end mounted for pivotal and reciprocal motion in the socket mentioned and extending outwardly and downwardly from the lug, to co-operate with the base and lug to embrace a tire. Means are provided for locking the outer lower end of the lock bar to the base block.

No. 1,015,422—to Archibald U. Campbell, Toledo, O. Granted January 23, 1912; filed June 20, 1911.

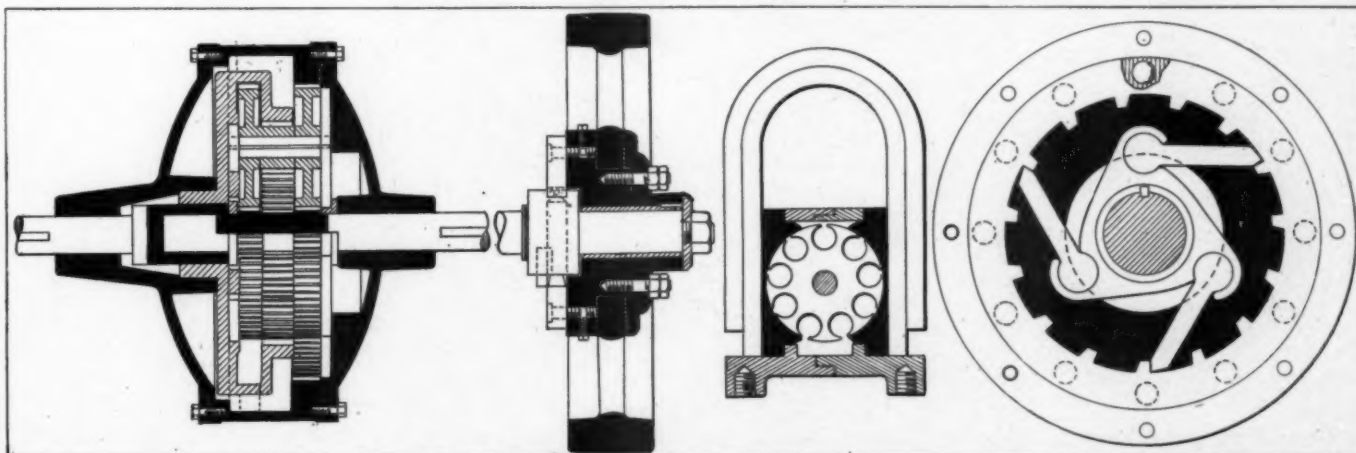


Fig. 1—Conant transmission.

Fig. 2—Clouse flywheel.

Fig. 3—Kelly magneto.

Fig. 4—Mustin clutch.

Newest Ideas Among the Accessories

Interchangeable Spark-Plug; Assists the Carbureter; Warms the Mixture

E. Z. Spark-Plug

THE E. Z. plug, Fig. 1, has the distinguishing characteristic of being made interchangeable, that is, if one part of the plug be lost, a part may be bought from the makers to replace it and thereby render the plug complete and workable again. The plug, as here illustrated, consists of nine parts, a thumb nut, lock nut, cap nut, bushing and three asbestos washers; also, a spindle, porcelain insulated core, core socket and plug socket. The construction is such that the plug may be opened, cleaned and closed in 4 seconds. By turning the upper portion of the plug, the core with both terminals is released, whereby the sparking gap is preserved, while turning the plug socket around the core socket frees the electrodes of whatever carbon may have settled on them. It is locked by a simple push of the finger. If the core is removed, the plug socket serves as a priming cup or compression relief. All these operations may be carried out without using a wrench. Another feature of this plug is that it contains no metal to metal joints, the compression being insured by the asbestos washers. The plug is made by the Auto-parts Manufacturing Company, 810 Westside avenue, Jersey City.

Thermo-Gasket

In Fig. 2 is shown a novel accessory to the power plant called Thermo-Gasket which is nothing more than a brass flange less than 1-2-inch thick; its outline is the same as that of the carbureter. The brass flange is bored to permit of a gas passing through it, and at two points the internal passage leads through the edge of the gasket to couplings of standard thread. One of these is connected, by standard copper tubing, to a similar coupling which is placed into a thread tapped into the exhaust pipe. The Thermo-Gasket has diagonal fins along its inner periphery, and these impart a whirling motion to the mixture passing through it.

The makers state the operation and effect of the device to be as follows: A small portion of the hot gases passing through the exhaust pipe of the motors flows into the copper tubing and

passes through the Thermo-Gasket around the intake lead between the carbureter and the manifold of the motor. The charge which passes through the hot ring is heated and thereby prepared for the process of combustion in the motor, while at the same time the whirling effect of the finned walls of the gasket mixes the charge thoroughly.

F. W. Battershall & Company, of 51 Maiden Lane, Albany, N. Y., are the manufacturers of this device.

Stanley Mixer

Fig. 4 illustrates the Stanley mixer, a device interposed between carbureter and intake manifold to provide a homogeneous charge to enter the engine cylinders. It comprises a short metal tube T, flanged at one end to fit into the intake manifold in the manner illustrated in Fig. 4. At top and bottom of the tube, a member D extends across the area of the tube. The mixer proper consists of a coiled spring wound about a vertical axis which runs on ball bearings placed in the center of the two members D. Two slightly tilted blades B are arranged on the axis as shown in Fig. 4 so that they are struck by the mixture traveling from the carbureter toward the motor intake and are imparted a rotary movement of considerable speed, as there is hardly any friction of the axis turning in its bearings. The rotation of the coiled spring and the blades tears up whatever liquid parts of gasoline pass through the mixture delivering a fine and equalized spray to the motor. This is the advantage of the device, as a homogeneous mixture gives a quicker and more efficient combustion than an unequal one. While the friction of the rotating axis is a negligible quantity, it must be remembered that the power actuating the device is the suction of the motor, so that while the homogeneousness of the incoming mixture is increased, the quantity of mixture sucked into the motor is reduced to some extent. However, the result, according to the makers, is the achievement of greater fuel economy, which is the thing desired by the owners of pleasure and commercial cars. Chas. W. Jacob & Allison, of 18 Cedar street, New York, are the manufacturers.

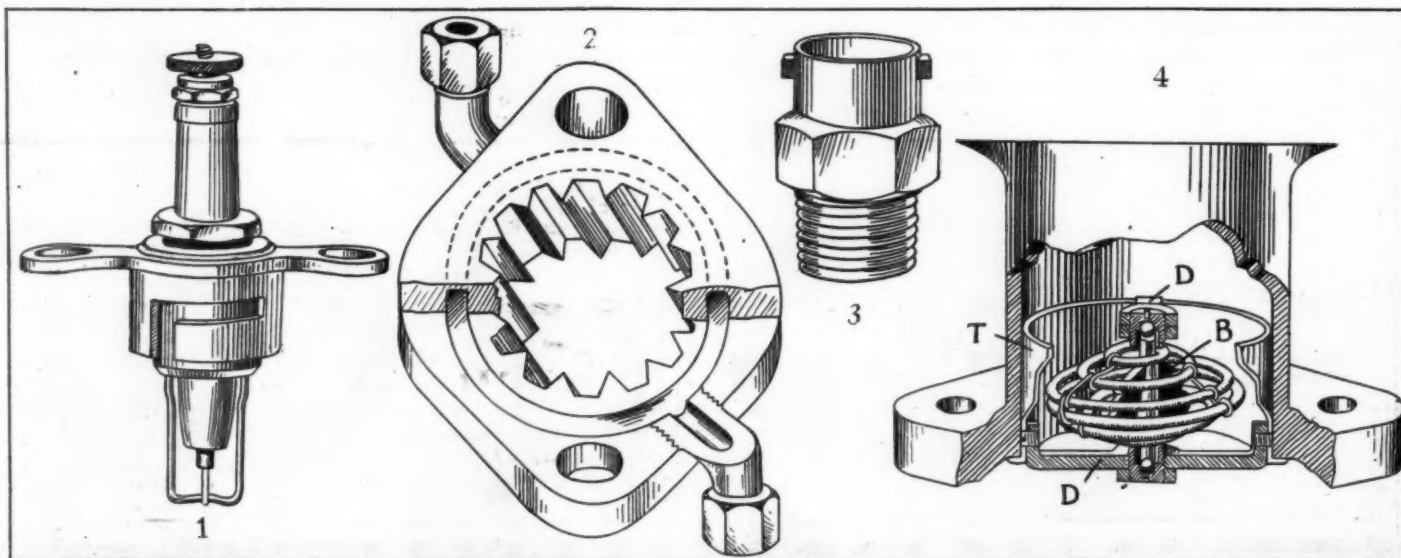


Fig. 1—E. Z. spark-plug core

Fig. 2—Thermo-gasket

Fig. 3—Lock nut of E. Z. plug

Fig. 4—Stanley mixer